

# American Aviation

MANAGEMENT  
ENGINEERING  
PRODUCTION  
OPERATIONS  
MAINTENANCE  
EQUIPMENT



**MAR. 2**



Robt. McCulloch  
President  
Temco Aircraft ... 19

Time to Cut Federal  
Spending Nears ...



U.S. Jets Come  
Out of Committee ... 13



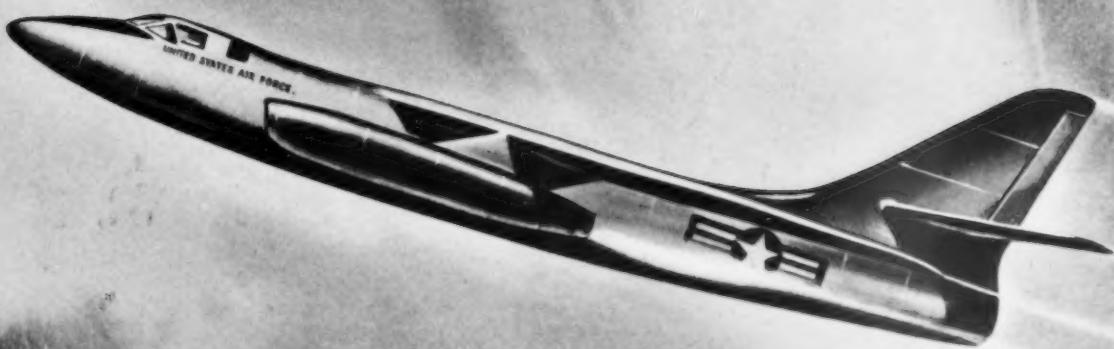
Wraps Come Off  
Turboprop C-130 ... 17



Flight Engineer  
Scrap Coming ... 18



WASHINGTON 25 D C  
DEPT OF THE ARMY  
OFFICE OF THE SECRETARY OF THE ARMY  
COORDINATOR OF LIBRARIES  
MAJOR JAMES H. HORAN 2813



## AIR FORCE'S NEWEST MEDIUM BOMBER

Here's the RB-66, Douglas' new twin jet bomber which will be rolling off the line this year at the Douglas Long Beach, California, plant. It will carry a crew of three and is designed to be an extremely high performance aircraft capable of speeds in the 600-700 miles per hour range.

It's a source of considerable satisfaction to us at Honeywell that the Air Force and Douglas selected the remarkably sensitive E-11 Autopilot for the job of making flight on the RB-66 easier and more precise. It's a further source of satisfaction that the Honeywell electronic fuel measurement system, standard equipment on more than 40 types of military and commercial aircraft, was also chosen to provide accurate, dependable fuel measurement so vital to increased aircraft utility.

The E-11 Autopilot and electronic fuel measurement system are but two of the many aeronautical control devices designed by Honeywell, which are proving themselves again and again in the service of military and commercial aviation.

Nowhere else are aeronautical controls engineered to surpass specifications by such a generous margin, or is the emphasis so much on *quality of product*.

We fully expect to continue in this tradition to develop more and better control equipment. Because automatic controls are essential to aviation progress. And automatic control is Honeywell's business.

**Honeywell**  
MINNEAPOLIS  
Honeywell  
Aeronautical Controls

First coach service with postwar twin-engined plane has started. Delta is running a Convair at off-peak hours Atlanta-Dallas with three stops.

This may be an answer to fears voiced by some in industry that airlines are only cream-skimming with four-engined coaches and that smaller cities merit service.

Jet transport operations are spreading. UAT, French independent, started Comets on February 19; Canadian Pacific is shooting for April 28, although its planes are still in England. Piston-engine carriers now realize threat of the Comet lies in operators' practice of using the plane as "bait" to book passengers on their services, by promise of possible jet space. BOAC has been filling other trips with overflow from Comets.

Rate at which BOAC is piling up jet experience is emphasized by fact that Comet I's have passed 10,000 flying hours—60% scheduled, 40% training, development, test, etc.

Largely overlooked is new-era aspect of turbo compound-powered Douglas DC-7 and Lockheed Super Connie. They'll increase speeds at least 50 mph, will carry heavier loads. They're new-type planes, not just improvements. Performance-wise they compare favorably with Comet I, and operate at half the cost.

Super Connie with the Wright powerplants has already made its first flight. Construction of DC-7 with same engines is on schedule.

Don't expect Military Air Transport Service to release the analysis of its operating procedures completed recently by a group of reserve officers (mostly from airlines) headed by Brig. Gen. Henry Kristefferson, of Pan American.

MATS' official reason: report contains too much classified material. Unofficial reason given by observers: report blasts MATS' methods.

Airlines look with concern on possibility of higher aviation gas prices following de-control. Some oil companies have already sought a hike in crude oil price.

Refiners have had to turn to use of more costly base stocks. They've also had big transportation costs between alkylate sources and refineries.

Airlines used over 750,000,000 gallons last year. One cent a gallon increase would add over \$7.5 million to fuel bill.

Aircraft and engine mechanic situation is alarming. There's been a big drop in number of certificated schools, students and graduates. Only 34 out of 95 schools are privately owned. Remainder are public—primarily vocational high schools which, past performance proves, mean little to aviation.

Only 12 private schools are regarded as healthy—they have more than 10 day students apiece, less than 90% veterans. Others are in precarious position—five have no students at all. Ironically, it's estimated that over 50% of graduates, public and private, will go into higher-paying non-aviation industries.

Air Force will soon begin applying incentive-type contracts to engine and equipment contractors. Airframe contractors began accepting this type reluctantly within recent months. Navy has had them for several years.

## The Washington View

### The Case of the Swinging Ax

The Eisenhower administration's economy program had a real send-off with the GOP-controlled House backing up the drive of its Appropriations Committee to cut military spending by trimming nearly 60% of the 1953 second supplemental appropriations bill totaling \$2.3 billion proposed by former President Truman. Biggest slice—\$1,200,000,000—came out of the Defense Department request which more than portends the lean days ahead facing the Armed Services. Leading the Congressional economizers is Appropriations Committee chairman John Taber, a 30-year veteran, who has his ax poised.

Taber will wield his ax lustily on funds for all departments and agencies but particularly has his eye on substantially reducing the 1954 defense budget. To this end, he has gathered together for committee assistance a group of expert investigators who are now scattered throughout the various departments screening business practices and finances. This group, which was drawn from private industry on recommendations of the U.S. Chamber of Commerce, went to work so quietly after an early alert that they have been dubbed the "Silent Sixty." Actually their number varies as new staff members are being continually added from a stand-by list. All types of industry have been tapped for this service. For example, an airline has had one of its top treasury officials cleared for Washington on a moments notice. First return of reports back to Taber are said to indicate that a long-standing state of confusion exists.

Also caught up in the changing pattern is the Civil Aeronautics Board, although an independent agency—the government's smallest, in fact—it too runs into the prospects of personnel reductions and general de-emphasis. To counteract renewed movements against its independent status, CAB is relying heavily on the Hoover Commission's report, which strongly recommended the Board's continuance as a separate entity. Proposals for wiping out the Board center around two possible methods: (1) transfer the functions under the Interstate Commerce Commission or (2) absorb the Board within the Commerce Department.

Continuing attacks on the Board from varying quarters, laden with caustic criticism, have not escaped attention on Capital Hill and the indications there are that the situation will rapidly be brought to a head. The burning question is "whether or not CAB has carried out its functions under the Civil Aeronautics Act."

United Air Lines, repeatedly, has leveled blasts of criticism at the regulatory agency and single handedly has fought for some "changes." Now, American Airlines has entered the open fray, and although it is not believed to be a coordinated "Big Two" attack, AA and United independently are aiming at the same objective. In teeing off on the Board recently, American apparently felt no qualms about offending a distraught Board, which under other circumstances has been Lady Bountiful. Defenders of the Board have been slow to respond, but smaller carriers, who have more to lose, can be expected to speak up.

Meanwhile, the alignment of the present Board membership is still being shaken down following individual White House visits in recent weeks by the two Republican Members, Oswald Ryan and Chan Gurney. Incumbent Chairman Ryan's Presidential interview, coming two weeks to the day after Member Gurney's, for a second briefing of the chief executive on "detailed operations" of the Board, had all the earmarks of an attempt to gloss over an obvious "faux pas." The White House is said to have suddenly realized, too late, after Gurney's visit, that the junior member had gained the appearance of a new CAB strong man, and the call for Ryan was immediately initiated. However, the cumbersome appointment machinery grinds slowly, and it took a full two weeks before the "face saving" could be effected for the senior Member and Chairman.

Delay of the White House in making an appointment to the existing vacancy on the Civil Aeronautics Board has only added to the unrest there. The tide of rumors continues to rise and fall as the long-pending decision is shrouded in secrecy. Leading the field initially was the candidacy of Harmar D. Denny, Jr., the ex-Pennsylvania Congressman had been reported receiving strong consideration supported by the backing of Senator James H. Duff and former National Republican Committee Chairman Hugh D. Scott. But his lead waned as the prophesied appointment became overdue and the Denny Bandwagon seems to have slowed down. Turning point could have been a New York newspaper story which created the impression that Denny was "in," as the White House is said to have taken a dim view of it. A political debt is owed Denny, who was redistricted in the 1952 elections but nevertheless carried the Republican banner in a hopeless race as his re-apportioned district was solidly Democratic. However, reliable sources say the White House is taking every step to avoid the embracement of being publicly pressured into appointments to responsible positions.

... Preble Staver

20-MONTH SERVICE RECORDS  
PROVE LONGER PUMP LIFE...

## STANDARDIZE ON SKYDROL

The charts shown here, drawn from service records compiled January 1951 through August 1952, spotlight an important operating advantage of Skydrol, Monsanto's nonflammable-type hydraulic fluid.

Skydrol's high lubricity makes possible longer pump life—surpassing that obtained with conventional petroleum-based hydraulic fluids. This is especially true in constant-duty high pressure hydraulic power transmissions.

*Skydrol: Reg. U. S. Pat. Off.*

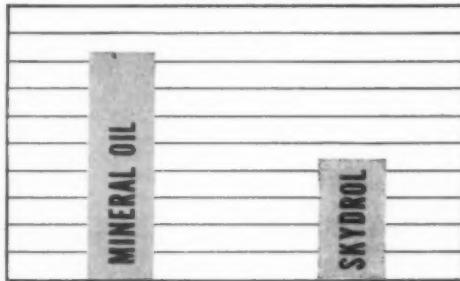


### REPLACEMENT RATE FOR ROTATING GROUPS IN VICKERS HYDRAULIC PUMPS ON DC-6 CABIN SUPERCHARGER TRANSMISSIONS

(Over 20-month period\*)

#### FIXED DISPLACEMENT PUMPS

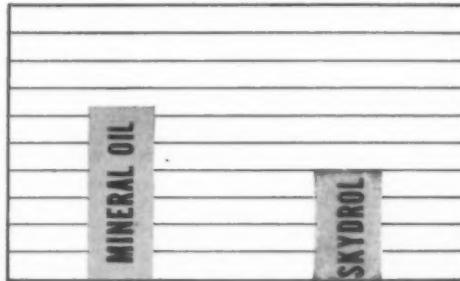
REPLACEMENT PERCENTAGE



Skydrol Reduced Replacement Rate by 49%

#### VARIABLE DISPLACEMENT PUMPS

REPLACEMENT PERCENTAGE



Skydrol Reduced Replacement Rate by 41%

\*Figures were compiled at the time of overhaul of pumps. Analysis reviewed 345 mineral oil pumps, 884 Skydrol pumps, 343 mineral oil motors and 975 Skydrol motors.

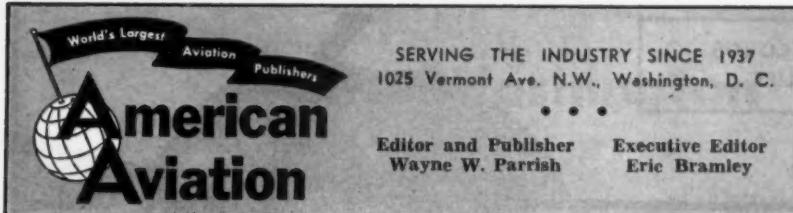


FOR TECHNICAL PERSONNEL. This 22-page book lists Skydrol specifications, pump wear and lubricity test data, compatibility charts, etc. Write us for your copy. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 800 North Twelfth Boulevard, St. Louis 1, Missouri.

MARCH 2, 1953



SERVING INDUSTRY... WHILE SAVING MONEY



SERVING THE INDUSTRY SINCE 1937  
1025 Vermont Ave. N.W., Washington, D.C.

Editor and Publisher Wayne W. Parrish Executive Editor Eric Bramley

Phone: Sterling 3-5400

Cable: AMERAV



Managing Editor  
William D. Perreault



JAMES J. HAGGERTY, JR. .... Military Editor  
JOSEPH S. MURPHY .... Technical Editor  
WILLIAM V. HENZEY .... Transport Editor  
ROBERT M. LOEBELSON .... Manufacturing Editor  
PREBLE STAVER .... Legislative Editor  
WALTER A. KILRAIN .... Copy & Production Editor  
KEITH SAUNDERS .... News Analyst  
ANTHONY VANDYK .... Internat'l Editor

FRED S. HUNTER .... West Coast Editor  
LOIS C. PHILMUS .... Corporation Aircraft Ed.  
WALLACE I. LONGSTRETH .... Rates and Tariffs  
RICHARD F. MCGRATH .... Special Assignments  
DORIS ROWZEK .... Airline Statistics  
R. G. WORCESTER .... Consultant  
JEAN-MARIE RICHE .... Paris Editor  
ROY PEARL .... London Editor

March 2, 1953

Vol. 16, No. 20

U. S. Jets Out of Committee ..	13	Terminal Audience Gets Ear Bent ..	30
Wraps Come off the C-130 .....	17	Industry Hale & Hearty: CAB ..	34
Flight Engineers Scrap Coming ..	18	Helicopters, Sure, But When? ..	42
Temco: Newcomer from Texas ..	19	Wall Helps Jet Noise Problem ..	45
Ham Stan Swings to Equipment ..	24	Twin-Engine 'Copter Coming ..	50

**THIS MADE NEWS:** USAF Spare Parts Plan, p. 16 . . . Heavy-press program faces reduction . . . APB wiped out, p. 22 . . . Aircraft play big role in flood-lift, p. 26 . . . ACC C-9 revisions up material allocations . . . Airline and aircraft labor contracts approved, p. 39 . . . New policy of Airport Use Panel . . . Transport Equipment Company reports \$2 million backlog, p. 43 . . . Local service lines had big year in 1952, p. 48 . . . Five Carriers gang up on baggage, p. 67.

**AMONG THE DEPARTMENTS:** Editorial, p. 6 . . . News Letters, p. 9 . . . Industry Spotlight, p. 11 . . . News Briefs, p. 15 . . . Military, p. 33 . . . Production Picture, p. 38 . . . West Coast Talk, p. 39 . . . Extra Section, p. 52 . . . Maintenance Bulletin Board, p. 54 . . . New Products, p. 59 . . . Technical Literature, p. 60 . . . Airline Commentary . . . Photo Credits, p. 63 . . . CAB News, p. 65 . . . People, p. 66 . . . Statistics, p. 68 . . . International Report, p. 69 . . . Bulletin Board (Classified advertisements) . . . Advertisers Index, p. 77 . . . En Route, p. 78.

General Manager: Leonard Eiserer  
Director of Advertising: Stephen R. Kent  
Circulation Promotion Mgr.: Larry Brettnet

American Aviation is published every other Monday by American Aviation Publications Inc., Washington, D.C. Printed at the Telegraph Press, Harrisburg, Pa. Subscription rates for United States, Canada, Mexico, Central and South American countries—\$5.00 for 1 year; \$8.00 for 2 years; \$10.00 for 3 years. All other countries—\$7.00 for 1 year; \$12.00 for 2 years. Entered as Second-Class matter in Washington, D.C., and Harrisburg, Pa.

**Change of Address:** Send old address (exactly as it appears on mailing label of your copy of magazine) and new address, including zone number, if any, to 1025

Vermont N.W., Washington, D.C. Allow two weeks for change-over.

**Publishing Corporation:** American Aviation Publications, Inc., Wayne W. Parrish, president; Leonard Eiserer, vice-president and general manager; Albert H. Stackpole, Eric Bramley, vice presidents; E. J. Stackpole, Jr., secretary-treasurer.

American Aviation incorporates Airports and Air Carriers, Airports, Aviation Equipment, The American Pilot, Aviation Sales and Service, U.S. Aviation and American Airports. All rights to these names are reserved.

#### ADVERTISING OFFICES . . .

**New York Office:** Administration Building, LaGuardia Airport, New York, N.Y. Illinois 7-4100. Stephen R. Kent, director of advertising; A. B. Copeland, regional advertising manager.

**West Coast Office:** Park Central Building, 412 West Sixth St., Los Angeles 14, Calif. Trinity 7997. Fred R. Hunter, manager.

**Chicago Office:** 139 North Clark St., Chicago 2, Ill. Central 6-3804. Bruce L. McGregor, regional advertising manager.

**Foreign Advertising Representative:** United Kingdom—Pearl, Coopers, Ltd., 2-3 Norfolk St., Strand, London, W.C. 2, Tel. Temple Bar 8111/2.

#### OTHER PUBLICATIONS . . .

**American Aviation Daily:** a daily news service for the industry, \$200 per year. Managing Editor: Keith Saunders.

**American Aviation Directory:** twice yearly listing of products, people and organizations, \$7.50 each. Managing Editor: Marion E. Grambow.

**Official Airline Guide:** Monthly publication of airline fares for 111 U.S.A. and countries belonging to Pan American Postal Union, including Spain and the Philippines. \$12.50 elsewhere. Published from 139 N. Clark St., Chicago 2, Ill. Central 6-3804. Managing Editor: Robert F. Pfeifer.

**American Aviation Traffic News (incorporating Air Tariff Reports):** Daily rates and tariff news, \$150 per year. Managing Editor: Wallace I. Longstreth.

## When & Where

Mar. 11-13—Indiana-Ohio Joint Agricultural Aviation Conference, Purdue Univ., W. Lafayette, Ind.

Mar. 13—Institute of the Aeronautical Sciences, 8th Annual Flight Propulsion Meeting, Carter Hotel, Cleveland, Ohio.

Mar. 17-20—ATA Chief Pilots Meeting, Chicago.

Mar. 23-27—Congress of Aviation Organizations, Municipal Auditorium, Kansas City, Mo. (includes Airport Operators Council and AAAE, Mar. 23-26).

Mar. 23-27—8th Western Metal Exposition, Pan-Pacific Auditorium, and Western Metal Congress, Statler Hotel, Los Angeles.

Mar. 25-27—SAE Production Forum, Statler Hotel, Cleveland, Ohio.

Mar. 26—ATA Public Affairs Committee, Annual Meeting, Kansas City, Mo.

Mar. 27—National Association of State Aviation Officials, Board of Directors Meeting, Kansas City.

Mar. 31-Apr. 2—1st International Magnesium Exposition, National Guard Armory, Washington, D.C.

Apr. 18-19—Air Force Association, California Wing Convention, Hotel Manor, San Diego, Calif.

Apr. 20-24—SAE, Aeronautic & Aircraft Engineering Display, & Aircraft Production Forum, Hotel Governor Clinton, New York.

Apr. 29-May 1—AIEE-IRE Electronics Components Symposium, Shakespeare Club, Pasadena, Calif.

May 11-13—IRE National Conference on Airborne Electronics, Dayton Biltmore Hotel, Dayton, Ohio

May 14-17—9th Annual Forum, American Helicopter Society, Mayflower Hotel, Washington, D.C.

May 18-22—5th National Materials Handling Exposition, Convention Hall, Philadelphia, Pa.

May 19-22—ATA Operations Conference, Park Plaza Hotel, St. Louis, Mo.

May 19-23—Aviation Writers Association, Annual Convention, Dallas, Tex.

June 6—4th Annual Maintenance & Operations Clinic, Reading Aviation Service, Inc., Reading Municipal Airport, Pa.

June 7-12—SAE, Summer Meeting, Ambassador & Ritz Carlton Hotels, Atlantic City, N.J.

June 9-11—2nd Int'l Aviation Trade Show, Statler Hotel, New York.

## International

Mar. 23—IATA, Medical Committee, 3rd Meeting, Estoril, Portugal.

Apr. 20—IATA, 6th Technical Conference, Puerto Rico.

May 14-22—FAI Conference, Scheveningen, Holland.

June 16—ICAO Assembly, Brighton, England.

June 26-July 5—Int'l Aircraft Engineering Convention, Paris; and Int'l Aircraft Show, Le Bourget Airport, Paris, sponsored by French Aircraft Industries Association.

AMERICAN AVIATION



# In Dayton, too, air travelers can step from the plane into a car from Hertz



here, as at most airports, HERTZ is ready to give your passengers the finest car rental service!

Yes, the Hertz station at Dayton Municipal Airport, Dayton, Ohio, is just one example of the excellent facilities and superior service offered by Hertz stations everywhere. For your passengers, who expect the best, only Hertz offers them *all* the advantages of car rental service.

Here are the reasons why HERTZ SERVICE is better for the air lines:

- Hertz, and only Hertz, can and does deliver cars to airports in more than 500 cities. Hertz maintains stations right at or adjacent to the airport in more key cities.
- Hertz with 29 years' car rental experience is dependable. It is the world's largest and only international car rental service—uniformly conducted in more than 500 cities throughout the United States, Canada, Alaska, Hawaii, Cuba, Great Britain, Mexico and Switzerland.
- The Hertz national advertising program consisting of full page advertisements

throughout the year in Life, Saturday Evening Post, Collier's, Holiday, National Geographic, Time, Newsweek, and U. S. News & World Report, promotes the Plane-Auto Travel Plan, creates new air travelers, puts new business on your planes and builds Hertz popularity.

- Your passengers, reserving cars from Hertz before they take off, can be sure of fine, new cars that are clean and properly conditioned. All gasoline and oil are furnished. Also, Public Liability, Property Damage, Fire and Theft Insurance and \$100.00 deductible collision protection are included in the low rate—at no extra cost.
- Your passengers can rent from Hertz day or night for any length of time and enjoy quick, courteous, efficient service. Hertz National Courtesy Cards and International Charge Cards are carried by more than a million and a half men and women and are honored at all Hertz stations.

For complete information write:

**HERTZ** *Driv-Ur-Self* **SYSTEM**

MARCH 2, 1953

Dept. C33, 218 S. Wabash Ave., Chicago 4, Ill., Phone: WEBster 9-5165



# Editorial

## The Time is Near

THE NEW REPUBLICAN administration is beginning to carry out its promises of cutting the waste and the fat—but not the muscle—of the nation's tremendously inflated federal economy. From every inside source in the capital there are clear indications that the cuts are coming.

by  
W. W. P.

The Republicans have also promised tax cuts, but the budget must be balanced and federal spending reduced before the drain on individual pocket books can

be eased.

Aviation, in the broad sense, is going to feel the cuts along with everybody else.

Here is the way we size up the situation from Washington:

**Defense policy and planning:** As we forecasted on this page last summer, and in our exclusive interview with General Eisenhower last August, there will be, shortly, a top policy commission established, with considerable authority, to re-examine defense policies and scrutinize the Defense Department. At this writing it would appear that Congress will create a commission of top civilians. This commission would report to Congress and work with the White House and the Defense Department with a goal of more defense for less money, more streamlining, elimination of duplicating functions, and greater efficiency.

**Foreign Activities:** Since 1947 the foreign policy of the United States has been based on the containment of the U.S.S.R. and its satellites. From a military standpoint this involved the building of many bases and installations around the long periphery of the Iron Curtain. It is certain that this policy of containment is going to be sharply attacked, altered, and possibly changed in most essential features.

Not only is the containment policy considered to be too costly and burdensome for this country to establish and maintain, but there is increasing doubt that containment is the proper method of meeting the challenge of the Soviet Union. Military implementation of the policy reached fantastic heights in expenditures and planned expenditures, plus necessitating the maintenance abroad of many hundreds of thousands of American personnel. It is certain that major modifications in the system of foreign bases and installations will be made but without destroying, it is hoped, the muscle of strategic bombing and strategic defense.

**Aircraft procurement:** It is not the intention of the new administration to interfere with sound, basic air power. But continued production of already-

obsolete aircraft is doomed. The vast system of second sources of supply is due for an overhauling. The tremendous waste in paper work and red tape in procurement is to be attacked sharply. The practice of tremendously costly equipment changes ordered constantly by the various specialized units is due for streamlining. The vast amount of duplication among the three major services—with guided missiles as one specific example—is to be eliminated to as large a degree as possible and as rapidly as possible. More than one Pentagon command which has spent and committed funds without regard for economy or efficiency is due for a rude jolt.

**Civil aviation:** Matching federal aid to airports may be more difficult to obtain, at least for a while. Cities and states will be expected to assume a much greater share of construction programs—and perhaps all of it. The CAA can look for cuts and even the CAB, smallest of all independent agencies, may have to cut. Local airlines will have to fight harder to justify mail pay at costly local stops. The administration's economy drive might well cause dislocations in airline traffic, and maybe some reductions in traffic. CAB will have to look closer than ever at expanding airline routes in a deflation economy. It wouldn't take a big drop in traffic to move the airlines into the red again.

**General contraction:** The period of reckless federal expenditures is over, although the basic economy will not be injured. Not in the past twenty years has the federal budget been getting such close scrutiny as it is getting now. Only the very beginning has been seen to date, but between now and July 1, when the new fiscal year begins, billions of dollars are to be knocked off the federal spending program. The number of federal employes will be noticeably reduced. The inflationary policies of the past administration are being replaced by the inevitable deflation. And out of such adjustment will come income tax reductions, a more efficient and streamlined federal economy, and a sounder nation.

It would be wise for every company within the aviation industry to take a realistic view of what is now happening under the new administration. The long-anticipated period of deflation has set in, but not all of its consequences have been taken into account.

Air power, as such, is not to be sidetracked. But the period of almost unlimited funds for almost unlimited projects is coming to an end. If tax burdens are to be eased, as they must be if our economy is to remain free, the value of the federal dollar must be renewed. This means controlling efficiently the vast flow of federal expenditures and, painful as that may seem to those who thought the flow was endless and limitless, it must come. The sooner the operation is over the better off we'll be.

... WAYNE W. PARRISH

AMERICAN AVIATION

fly **S·A·S** for Business or Pleasure...

visit **8 EUROPEAN CITIES**  
for the **FARE TO ONE!**

NEW YORK — GLASGOW — COPENHAGEN  
LONDON — PARIS — HAMBURG — FRANKFURT — GENEVA — ROME



Plan now to fly the line that gives you a travel bonus: extra cities at no extra fare. Visit these, on a round trip to Rome . . . one of dozens of extra-city trips on the finest service both to and through Europe.



**S·A·S** *Royal Viking*  
for LUXURY UNSURPASSED

SCANDINAVIAN AIRLINES SYSTEM  
30 Rockefeller Plaza • New York, N. Y.

WASHINGTON • PHILADELPHIA • CLEVELAND • CHICAGO • DETROIT  
MINNEAPOLIS • LOS ANGELES • SAN FRANCISCO • SEATTLE

Specify S-A-S to your TRAVEL AGENT

As appearing in TIME Magazine and the NEW YORKER

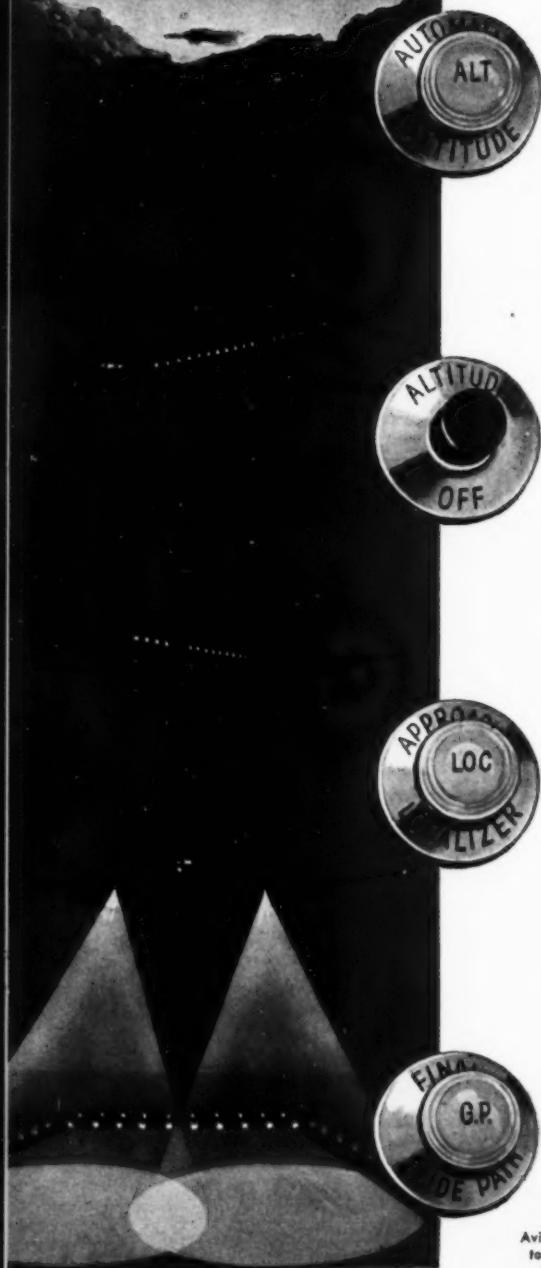
# Here is the AIRLINER AUTOPILOT<sup>1</sup>

A proven autopilot that sets a new high standard of precision flying from take-off to landing approach.

The rugged lightweight Lear L-5 features automatic altitude control, automatic approach coupler, automatic protection from hard-over signals — plus automatic safety release for manual control with a correctly trimmed aircraft. Plug-in replacements assure quick, low-cost maintenance.

The Lear L-5 and its military version — the versatile F-5 — are flying a wide range of aircraft, from jets to multi-engine transports . . . they're frequently called "The Pilot's Autopilot."

Before you install an autopilot — *and you will* — let a flight demonstration show you why the Lear L-5 Airliner Autopilot is what you have been waiting for.



*The Collier Trophy*

Aviation's highest award — recognition to William Lear for development of Autopilot and Approach Systems.



**LEAR, Inc.**

LEARCAL DIVISION, 11916 W. PICO BLVD., LOS ANGELES 64, CALIFORNIA  
Grand Rapids Division, Grand Rapids, Michigan; Romec Division, Elyria, Ohio

One of the World's Oldest and Largest Producers of Airborne Electronics

# Letters

(Following letter from Clarence Belinn is quoted in full because of its unusual interest.—Ed.)

## HELICOPTERS

To the Editor:

Somewhere a Frenchman was quoted as saying, "The more they change it, the more it is the same as it was before," and I think that little gem would place in perspective some of the recent stuff you have printed in your book about helicopters. I am, of course, referring to the excerpts from Bill Littlewood's Wright Brothers lecture and your recent editorial "Hard Facts and Helicopters."

First, let me say that I have the deepest regard for anything my life-long friend, Bill Littlewood, has to say. Secondly, let it be thoroughly understood that I do not take issue with the generalities of his sage words.

In fact, to a very great extent, he is saying precisely what I have said many times, many ways, and in many places. The chore of telling those who would listen not to expect "too much, too soon" has largely been mine, its purpose being, in some degree, to enlighten the untutored public that there are hard and fast rules, particularly where development is involved. The helicopter, like its predecessor, the airplane, must endure the trials and tribulations incidental to its growth and development.

Our parting of the ways is largely in the field of reality. In this segment of the business I feel myself in the position of advantage, both in respect to historical comparison and crystal-ball into the cold, unrelenting stages of development, which at this point, are unmistakably clear.

When you commence prognosticating the place of an article or a service over any appreciable period of time, you are really asking for trouble. Littlewood has left himself a hole into which to crawl by saying, "Encroaching upon the absolute minimum of aviation ranges, the helicopter will eventually find its economic niche." The contention here appears to be that the state of the art is comparable to the so-called diaper area or the goggles-and-duster days of the automobile.

This just is not so. And here is why. In our own operation over the past five years, we have logged approximately 30,000 flying hours involving an average of eight landings and take-offs per hour, or a total of 240,000 landings

and take-offs, during which time, on the basis of a one-way haul, because mail flows in only one direction each trip, we have maintained a load factor in excess of 50%, carrying a total of roughly 25,000,000 pounds of cargo.

Those figures are relatively meaningless until I tell you that our fleet ratio of spare aircraft and spare parts compares most favorably with that of fixed-wing airlines, but most important, the record of mechanical delays, on-time performance, and unscheduled landings is better in many respects than that of fixed-wing carriers, even as of today.

Now, as to performance. Our model S-51 helicopters, which are at least ten years old in concept, will pick up, without the aid of an airport, 1,000 pounds of payload and chug along at between 80 and 90 miles an hour at 50% of the power output of a 450 hp Wasp Junior Engine. It is agreed that the range in this instance is short, but the number of people which it serves is astronomical.

Before leaving that phase of the discussion, it is well to touch a little more on the author's reference to mechanical complexities and their implications, both in retrospect and ahead. It is true that the helicopter is more complicated than the old-fashioned "frozen-wing" aircraft. Why shouldn't it be? It carries its own airport too. But in all seriousness, some of these complexities have been borrowed from the airplane, and they will be licked, just as they were with the airplane.

Many of us remember when experts who were "on the inside" and possessed the know-how were positive

that the air-cooled engine would never go beyond 300 hp. In fact, so strong were these convictions in military circles, if I remember correctly, that the Army put its important money on the water-cooled principle for future development, but neglected to tell some of the boys in the Navy, who, not knowing better, went ahead and sponsored high output air-cooled engines.

If the past can be a yardstick for the future, and I hope it can, I can foresee history repeating itself, and soon, to the extent where the transmissions and especially the rotor heads, which we now take down at 300 hours as compared with 100 hours maximum for the 300 hp Cyclone in those days, can be expected to run on the helicopter as indefinitely as they do on a bus. Yes . . . there will be a price in weight, but be patient. Perhaps we will eliminate those components entirely.

On some of Bill's points, I should like, in the following paragraphs, to be more specifically responsive.

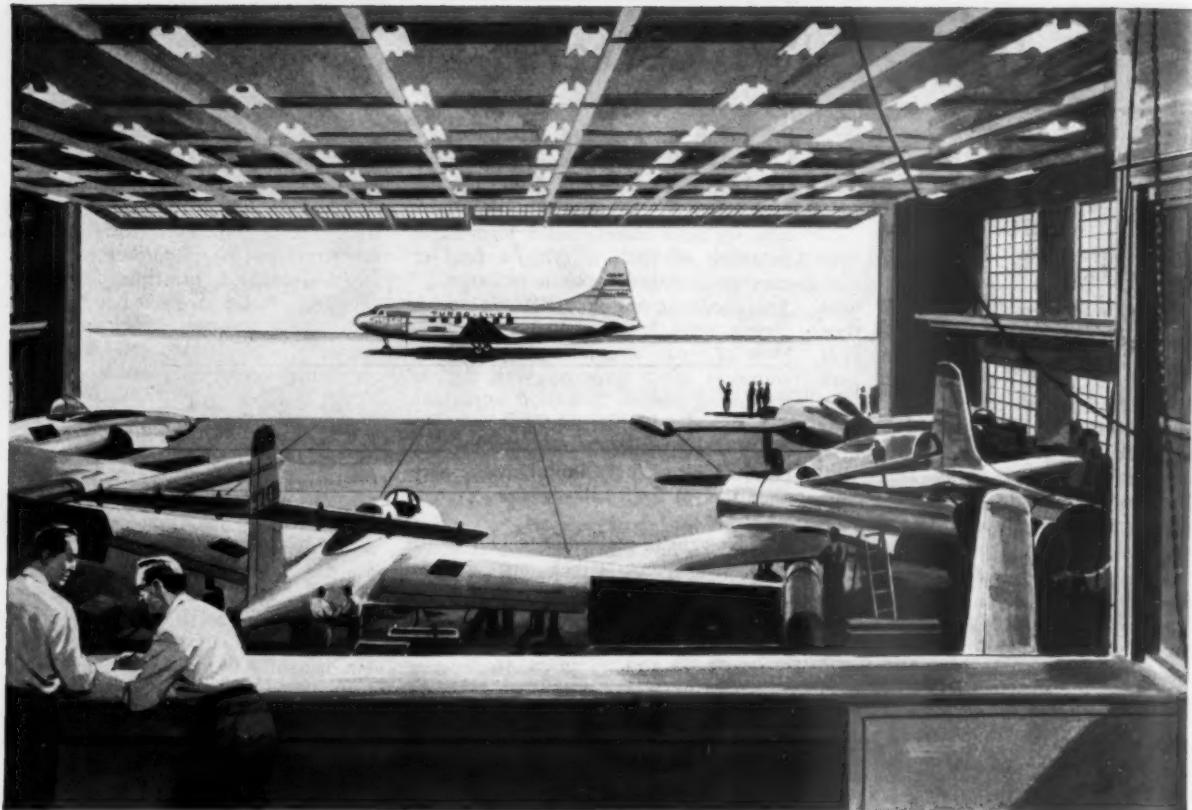
• **Single-Engine Helicopters.** Let me be the first to assure you that the transport category of helicopter operators concur wholeheartedly in the need for multi-engine machines. In fact, it is almost three years ago now since our company presented the manufacturing industry with a blueprint and a set of specifications for a machine in about the Electra-Lodestar category, so that the idea is not a novel one.

Furthermore, you know, of course, that no greater mystery surrounds the building of multi-engine helicopters than is true with airplanes. In fact, at

(Please turn to page 74)

THIS ISN'T IT . . . but it could be later than some people think.





## We do more than build engines

Maybe you've never thought of it this way, but here at Allison we believe an aircraft engine builder's responsibility goes way beyond the product he builds. We think of our job as helping to create the kind of engine installation which will enable airplane and engine to deliver their best performance long after they have been delivered to operating activities.

That's why we have—in addition to *engine* engineers—a group of specialists whose job is to assist aircraft manufacturers in getting the most out of the jet engines we build. This group includes structural designers, aero-dynamicists, stress analysts, engineering test pilots—men with solid experience in all phases of aircraft design and construction.

Working at our flight test facility in Indian-

apolis, these men install our engines in flying test beds and check engine installations in finished planes. Engine control settings are worked out to fit particular airplane conditions and air intake and exhaust systems are studied to be sure of the best possible environment for the engine.

Such specialists are an important part of Allison's great engineering team, which is backed by the GM Technical Center in Detroit, and by the engineering staffs of other GM divisions.

This tremendous pool of engineering knowledge and experience helps explain the continuous improvement in the already superior performance of Allison jet engines—engines that have flown more hours in the air than any other make of jets.



*Allison*

DIVISION OF GENERAL MOTORS, INDIANAPOLIS, INDIANA

World's most experienced designer and builder of aircraft turbine engines  
J35 and J71 Axial, J33 Centrifugal Turbo-Jet Engines, T38 and T40 Turbo-Prop Engines

## Industry Spotlight

**L**YCOMING-SPENCER is circulating a proposal for a 525-horsepower helicopter engine, which it will build if sufficient assurance of a market can be established. The eight-cylinder, horizontally opposed engine, designated the GSO-785, is 61.30" long, 30.75" high and 36" wide. Lycoming is seeking either military or manufacturing interest in providing development funds.

First production model of the Boeing B-52 Stratofortress is still more than a year away. The Y model made its first flight last April 15 and the X model on October 2. Tooling for the intercontinental bomber replacement for the Convair B-36 is progressing, but normal time between the first flight and first production model is estimated at two years.

Unless foreign sales mature very shortly, there will be over-production of the Rolls-Royce Avon engine. The company's chairman, Lord Hives, has been in the U. S. attempting to interest a U. S. manufacturer in production rights for the Conway by-pass jet engine which will go in the Comet IV and Vickers VC-7.

Sikorsky's S-56, which will be powered by two Pratt & Whitney R-2800 engines, is reported to be a 40-passenger helicopter which would meet the transportation requirements of many potential operators. Three prototypes are under construction for the U. S. Navy.

Lockheed's first Commercial L-1049C Super Constellation, the one which will be used for flight testing this series Constellation for 130,000 pounds gross take-off weight, made its first flight in mid-February. It is destined for delivery to KLM.

Violent wing flutter experience with production models of the Vickers-Supermarine Swift is the principal reason for U. S. off-shore procurement interest switching from this fighter to the Hawker Hunter. Swift will require modifications that will delay service operation for about two years, thus wrecking plans to introduce it into service in Korea this summer. The RAF is now pushing to get 300 Hunters before the MSA order for about 500 planes is filled.

Rotating red beacons now being installed on the tail fins of United and American Airlines planes will be built by Grimes Manufacturing Company of Urbana, Ohio. United developed the design in cooperation with General Electric. G.E. developed the 18,000-candlepower sealed beam with a "V"-shaped reflector which is suspended over it and turns at about 40 revolutions per minute.

Conversion kit for Grumman Widgeons providing for the installation of Lycoming 260-horsepower engines instead of 200-horsepower Ranger engines is being offered by McKinnon-Hickman Company of Portland, Oregon at \$9,800, exclusive of engines and propellers. Modified Widgeons have a maximum speed of 182 mph, service ceiling of 18,000 feet, and range of 600 miles.

Fletcher Aviation Corp.'s FD-25 is en route by boat to Japan, where it may be manufactured under license by Toyo Aircraft Company if orders can be promoted. The FD-25, called the "Defender," is a single-place, ground support plane. Prospects for sales to countries of Southeast Asia show more promise than those within Japan.

France's aviation industry produced 609 military aircraft in 1952 against 449 in 1951 and 251 in 1950. Strength of the French Air Force now includes almost 600 combat aircraft in 28 squadrons.

Mock-up of the Handley Page R3 is being constructed at the company's Reading plant. Plane will be powered by four 550-horsepower Alvis Leonides engines and will seat only 28 passengers. Wing span will be about 75 feet, a Marathon wing with extension. Earlier reports indicated the more powerful Leonides Major engines would be used in a 36-passenger version.

## TANK RESEALING FOR EXECUTIVE AIRCRAFT BY

# TEMCO



CASE HISTORY: #811-108

CUSTOMER: GENERAL MOTORS  
CORPORATION

SHIP: LODESTAR N-5111

Complete resealing of integral fuel tanks with MMM EC-801 sealant. Job completed in eleven working days. This is the fourth Lodestar tank reseal performed by TEMCO-Greenville for General Motors in the last six months. Others were N-5114, N-5113, N-5116.

The above-described project is a typical aircraft rehabilitation job from the list of over 2,000 that has established TEMCO's reputation for doing every job undertaken *faster, better and at lower cost*. This complete service, formerly available only to air carriers and government agencies, is now offered to operators of multi-engine executive aircraft.

For full details on this case history and information about TEMCO's complete custom rehabilitation service for multi-engine aircraft, write on business letterhead to:

Herron Bellomy, Gen. Supt., TEMCO  
Aircraft Corporation, Greenville Over-  
haul Division, P. O. Box 1056, Green-  
ville, Texas.



# B.F. Goodrich



## 8 miles high without bubble trouble

THE CANOPY BUBBLES on fast military airplanes, like the Northrop Scorpion above, had to be safely pressurized at altitudes of 8 miles or higher. But the ordinary inflatable seals between bubble and cockpit couldn't take the effects of high pressures on the inside, low pressures on the outside.

B. F. Goodrich engineers, called in by the customer, studied the problem. A really effective seal, they believed, should stretch very little or not at all. Less stretch would mean lower pressure, less strain. They worked out a seal with a solid base fastened to the rim of the cockpit and a rubberized fabric covering that simply *lifts* when inflated

to form the sealing tube. When this tube inflates, it works like blowing up a paper bag—low pressure brings it to its full expansion and doesn't stretch the fabric enough to notice it. Dangerous stretching of tube wall (like blowing up a toy balloon) is eliminated.

The new seal works almost instantly. Even at minus 65° it inflates with less pressure than old-type seals needed at room temperature. There are other advantages. It resists wear and damage better than ordinary seals. It fits complex curves better. It seals and unseals faster. Sliding wear and scuffing are minimized. It has proved so superior that it has been adopted by McDonnell

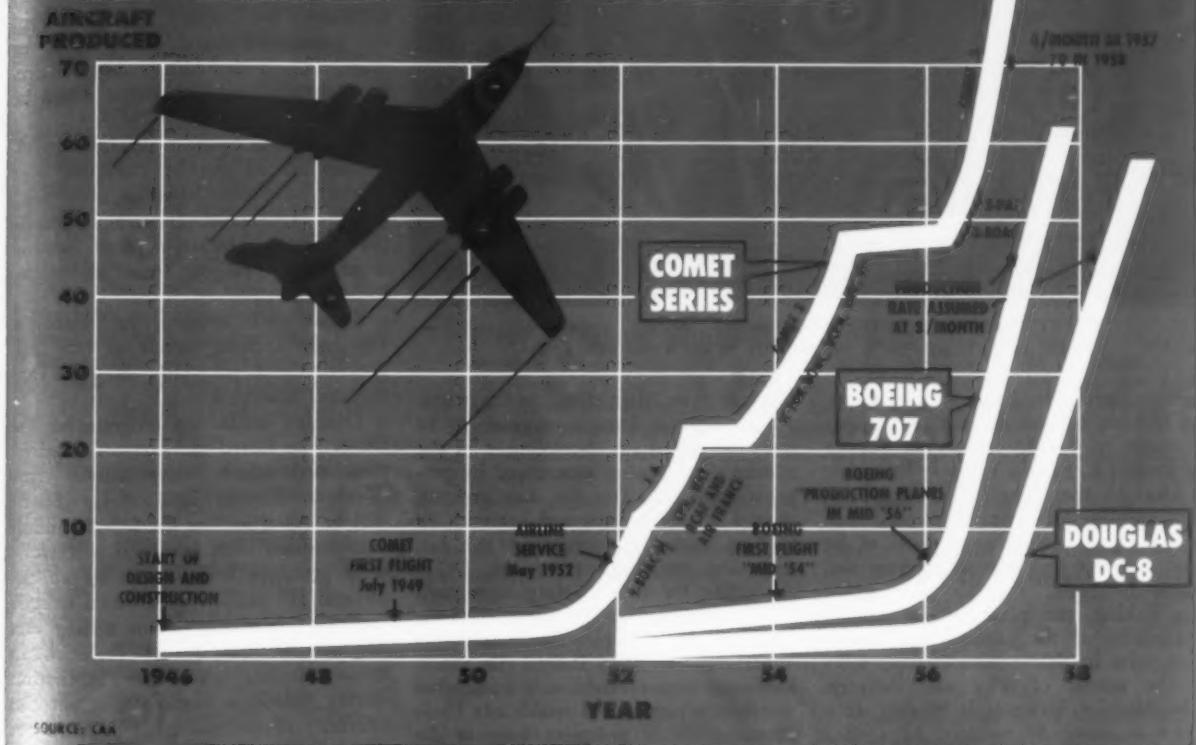
Banshee, Chance Vought Cutlass, North American Sabre and other airplanes besides the Northrop Scorpion.

This new type seal is one of many developments for aviation that has come from B. F. Goodrich rubber research and engineering. Other aviation products include tires, wheels and brakes; heated rubber; De-Icers; Avtrrim; Plastilock adhesives; Pressure Sealing Zippers; fuel cells; Rivnuts; accessories. *The B. F. Goodrich Company, Aeronautical Division, Akron, Ohio.*

**B.F. Goodrich**  
FIRST IN RUBBER

AMERICAN AVIATION

## JET TRANSPORT PROGRESS



SOURCE: CAA

BRITAIN'S LEAD in the number of jet transports produced promises to last at least until 1958, and probably beyond.

## U. S. Jets: Out of Committee, into the Shop

**Britain holds a comfortable lead, but progress in U. S. is shifting from talk to prototypes.**

By WILLIAM D. PERREAULT

PROBLEMS surrounding the development, production, and operation of turbine powered transports in this country have been the subject of continuing study by government-industry committees since early 1945. During his recent visit to this country to work out details of certifying the de Havilland Comet with CAA, Britain's R. E. Baddingham, chief of the Air Registration Board, noted the apparent lack of progress and commented:

"It's evident to me that you've spent too much time in committees."

It is now equally evident that the U. S. manufacturers have deserted the committee room for the design boards

and are turning from the design boards to the experimental shops. As this goes to press these developments highlight the fast-changing U. S. jet program:

• **Douglas Aircraft Company** has scheduled a Board of Directors meeting at which two specific proposals for starting to "cut tin" for a jet transport will be considered and a program officially adopted. (They may already have met when you read this.)

• **Boeing Airplane Company** is ahead of schedule on the prototype B-707, or Project X as it has been called, and the once optimistic flight date of mid-1954 appears assured.

• **Pratt & Whitney Aircraft** has made specific commitments with Boeing to supply the J57 engines needed for

Project X, the jet transport-tanker.

• **Curtiss-Wright's J67 Sapphire** engine has entered the commercial jet picture on a serious scale, with Douglas proposing it as an alternate powerplant for the P&W J57 in its DC-8 proposals.

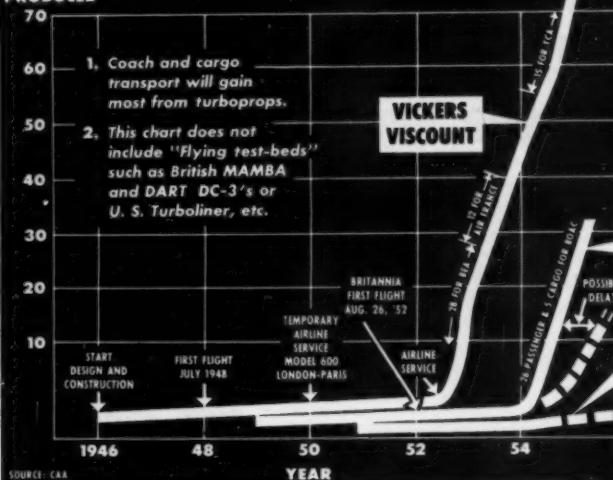
• **Lockheed's** plans for the greatly revised L-193 remain undisclosed, but the company has completed its jet transport evaluation for the U. S. Air Force and submitted its report.

• **Convair** remains a dark horse in the jet transport picture. It is nearing completion of its USAF jet transport evaluation but remains quiet in the commercial field. Basic feeling at Convair remains that a jet tanker-transport is a vital military need, but the next move appears to be up to the USAF.

The jet engine picture, which until recent weeks appeared to be the real sticker in any discussion of a jet trans-

## TURBOPROP TRANSPORT PROGRESS

AIRCRAFT PRODUCED



SOURCE: CAR

IN TURBOPROP-POWERED transports, Britain shows no signs of being overtaken by this country in the foreseeable future.

port prototype, has been sharply altered. In addition to making military engines available to Boeing for service testing on Project X, Pratt & Whitney has made it clear to the other major companies that similar deals can be worked out. Major stipulation is understood to be that these are development engines and cannot be resold.

Taking the place of jet engine availability as the number one discussion point in airline/manufacturer talks is the matter of price and delivery. Douglas, for instance, is hinting at a price of about \$4 million. As United Air Lines president W. A. Patterson has said: "Today the price of the jet is in the conversational stage, but even the conversation is staggering."

The airlines are inclined to think that the manufacturers could produce and sell aircraft of this type for about \$2½ million. The joker remains the matter of the potential market. Development costs must be spread over a number of aircraft for which there exists a reasonably sure market. Indications are that Douglas, for instance, is unwilling to spread development costs over more than 75 aircraft.

The problem is not confined to Douglas. Boeing, with its jet transport well under way, is reluctant to quote prices. Right at this time Boeing is reviewing the whole basis of pricing jet transports. No small matter is the uncertain status of engine prices. Cost of a P&W J57 engine is quoted at \$125,000, but that's a production price for some future date. Jet engine prices will probably be reasonable figured on an equivalent horsepower basis with piston engine models, but the power

involved is as "staggering" as the prices.

Activity at Douglas appears to be the most important development in the picture since Boeing announced its program last fall. Douglas has recently started a series of symposiums with its leading customers, reviewing the history and performance of the DC-8. Attending the first meeting were such prime customers as American Airlines, Eastern Air Lines, Pan American World Airways, and United Air Lines. Later meetings brought in a number of the foreign carriers, on which any U. S. manufacturer is going to have to depend to help spread development costs.

### What DC-8 Offers

Essentially this is the plane Douglas is offering the airlines in the DC-8: while following traditional Douglas design lines, the DC-8 incorporates sweep in the wing and tail. The engines are being mounted individually on struts beneath the wing. The P&W J57 is the prime engine in the proposal, offered both with and without afterburner.

The Curtiss-Wright J67 is offered as an alternate engine. This would be for long-range operations, like nonstop westbound across the United States or eastbound across the Atlantic. The J67 would not be available until sometime after the J57. Favoring the J57 installation in any early U. S. jet transport is the backlog of experience that will be gained with its operation in the Boeing B-52, the F-100, and the Convair F-102 before a commercial version is produced.

Payload of the DC-8 is calculated at around 22,000 pounds and cruising speed at 545 miles per hour. The standard ver-

sion would be a 68-passenger aircraft, but a high-density coach configuration can be provided, handling 100 passengers with three-and-two seating.

Airline officials have indicated that the Douglas DC-8 requires ranges of 1,500 miles or more to make it profitable; however, in its present talks with the airlines Douglas is quoting operational data on routes as short as the Washington-New York run. In United's operations, for instance, only 13½% of the passengers travel 1,500 miles or more. This means UAL's fleet requirement for a plane of this type would be about 10 planes.

By way of contrast, the USAF evaluations carried out by Lockheed and Convair have been based on three basic types, a 1,500-mile plane, a 2,250-mile plane, and a 3,000-mile plane. Seating requirements ranged from 40, 60, to 80 seats.

Douglas is assuring the airlines it will have a flying article in 1957, approximately a year later than the announced Boeing schedule. Less definite is Douglas' production program for the DC-8. The Board of Directors meeting, mentioned above, may answer this dilemma. Reports indicate the Board will be asked to vote for \$20-25 million authorization with which to start work on a prototype and perhaps for an additional \$15 million with which to start additional fabrication, some tooling, etc.

Douglas has always preferred to initiate tooling and some fabrication during prototype construction, but the enormity of the risk in a jet transport may cause the Douglas directors to shift gears this time and not go beyond a prototype.

No small factor in the accelerated pace of development in the U. S. is the changing picture abroad. The foreign market has taken on increased importance in the postwar period. One major U. S. manufacturer, for instance, finds 50% of its market abroad. The earlier feeling that the Comet design was a one-shot affair which would die an economic death before heirs were forthcoming has passed. The now-flying Comet II, the Comet III's ordered by British Overseas Airways and Pan American, and the recent announcement of the Vickers VC-7 program to replace Comet III's (probably by 1960) have changed this outlook.

No one seriously fears the British will take over the long-held U.S. position of dominance in this field. But few doubts exist that the British industry could corner enough of the market to seriously affect U. S. production and pricing policies.

## News Briefs

Navy progress on turboprop engines has taken it "out of the woods" with the A2D and has brightened the picture with the Convair XP5Y-1 flying boat, according to Rear Adm. John B. Moss, assistant chief of the Bureau of Aeronautics for Material and Services.

New special assistant to the Secretary of the Air Force to handle research and development is Trevor Gardner, president of Hycon Manufacturing Co. of Pasadena, Calif. Gardner was once director of development engineering at Cal Tech.

The potential of convertiplanes in the military and commercial fields will be explored by a Convertiplane Policy Working Group set up by the Air Coordinating Committee. Heading it will be Col. William B. Bunker, U. S. Army.

A proposal that Colonial Airlines charter a Lockheed Constellation L-749 from Eastern Air Lines for use on the New York-Bermuda run starting April 1 has been submitted to the CAB for approval.

Resignation of Edwin V. Huggins as Assistant Secretary of the Air Force has been accepted by President Eisenhower. Huggins returns to Westinghouse Electric Corp. as vp-corporate affairs.

Net profits for New York's airports fell off in 1952 to approximately one third the 1951 figure: \$345,000 as compared to \$1,094,270, the Port of New York Authority has revealed, but gross revenues rose to \$7.8 million, considerably above the \$5.4 million taken in during 1950.

Bendix Aviation Corp. reports a first quarter in which net income ran to \$1.83 per share, or a total of \$3.9 million. Last year in the same period: \$1.57 per share.

Civilian airports damaged by military operations will be reimbursed according to a bill, S.35, which has been favorably reported out of Senate's Interstate and Foreign Commerce Committee. Bill eliminates cut-off dates and makes airports that have recently been taken over subject to same reimbursement proceedings as applied in World War II.



**First Banshee photo** shows McDonnell F2H-2, new twin-jet all-weather Navy fighter, sporting new anodized finish on routine test flight. New finish is being tested by Navy fleet units to determine durability during carrier operations. Changes in F2H-2 include improved radar, more powerful armament, and increased internal fuel capacity.

The president of Continental Motors Corp., C. J. Reese, has been appointed to the Michigan Aeronautics Commission, replacing Thomas E. Walsh of Grand Rapids.

A 45% cut in trans-Atlantic cargo rates for bulk shipments has been proposed by Pan American. Reduction, which was proposed to the IATA special specific commodity rates board, would apply to shipments of over 1,100 pounds.

United Air Lines has sold all of its 28-seat DC-3's, but details of the sale have not yet been released.

The Flying Tigers, too, have been acting as salesmen, having re-sold 12 of the 13 Curtiss C-46F's that they had bought from Civil Air Transport, Inc. Six went to Riddle Aviation Co. of Miami, and six to Intercontinental Airways of Burbank, Calif.

"Operational suitability testing" is next on the program for Ryan's pilotless jet target plane, the Q-2, and a group of officers and enlisted men at Holloman Air Development Center, Alamogordo, N. M., is undergoing the appropriate training.

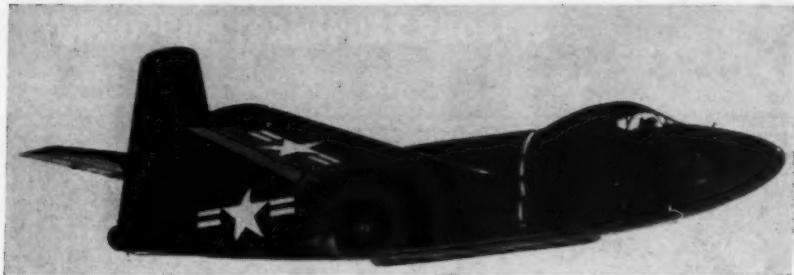
The strike of 1,400 UAW-CIO workers at the Fairchild Engine Divi-

sion plants at Farmingdale and Valley Stream, L. I., N. Y., ended after 25 days as company and union officials agreed on higher wages, a continued union dues check-off, and other benefits, but not the union shop that had been asked.

Another order for a sizeable number of Douglas C-118 transports has gone to Douglas Aircraft from the USAF. The plane is the military version of the DC-6A Liftmaster, of which MATS already has a considerable number in service.

Domestic air freight carried by the nation's four scheduled all-cargo airlines ran to approximately 123 million ton-miles last year, a gain of 14% over 1951, despite statements to the contrary from the trunk lines, according to L. R. Hackney, executive vice president of the Transport Air Group. The trunk lines had reported that business had fallen off for the cargo lines by almost 8%, asserted Hackney, who viewed the passenger lines' motives with some suspicion.

Grumman didn't make quite as much net profit per share during 1952 as during the previous year, but it was close. For 1952: \$2.67 a share; for 1951: \$2.73. This despite a rise in total sales from \$168 million to \$221 million.



**Marines in Korea** have started flying Douglas F3D's (above). Latest tabulation shows Skyknight pilots have downed four Red jets and one piston fighter, plus probably one piston-engine craft. Lockheed's all-weather F-94B Starfire interceptor is also in action. In the war zone since late summer, the F-94B has thus far been credited with shooting down one Russian-built LA-9 jet. No F-94's or F3D's have been reported shot down.

## USAF, Under Fire, Produces Parts Plan

New system, suggested by study group, saves \$53 million when tried out at one depot alone.

By PREBLE STAVER

THE NEW Republican-controlled Congress is currently giving every indication that it will work hand-in-glove with the Eisenhower administration in a joint effort to trim the fiscal 1954 budget, with particular emphasis on cutting the defense budget. In light of this trend, the Air Force is faced with the threat of a new "stretch-out" of the air power expansion program which could, in effect, mean that previously approved goals, such as 143 wings, may never be realized (see page 33).

Undoubtedly the Air Force will put up a strong battle to maintain the present programs, but it is not too confident of success. Beset from all sides in the Congress by a steady stream of charges of "waste, extravagance and inefficiency," the Air Force has its hands full even before it can begin justifying new and additional monies. There have even been Congressional charges of questionable planning and strategy, all of which means Air Force appropriations may suffer as a result.

Storm warnings on Air Force appropriations have been hanging out for some time and it was only last summer that a fresh burst of criticism was aimed at three of the service's basic functions which were (1) personnel; (2) procurement; and (3) base installations. In recognition of these danger signs, the Air Force lost no time in immediately setting-up new and additional study groups to go into specific problems in these areas. To date there has been only one report released on the progress of any of these groups and that was one by

the special Spares Study Group. Then, however, only a small portion of the Spares Report was declassified, but the portent of savings that can be made in this one field alone is considered to be the rule rather than the exception, as the report backs up charges that the Air Force was spending too much money for spares parts.

The Spares Study Group, headed by H. O. King, special consultant to the USAF Chief of Staff, said it was difficult to appraise the savings which will come from control methods devised for decreased spares requirements and faster pipeline time, but it is hoped to save "several hundred million dollars."

Investigation showed, he said, that expenditures for spares and spare parts are concentrated in relatively few items. In general, about 3% of the items account for 50% to 60% of the money spent for spares. And in turn, the major portion of these high-dollar value items are required to fill long and overly-extended pipelines. King said a three-fold approach was used in arriving at the new method to control computation of spares requirements which consisted of:

- Research into ways and means of reducing spares inventory through airlift.
- Evaluation and revision of factors used for computation of spares requirements.
- Development of sound and adequate procedures for control of high-dollar value items.

The method evolved by the group is to be adopted by the Air Materiel Command, from which the ultimate result will be a lower level of spares stocks

on hand at USAF bases and a reduction in pipeline stocks as well.

Basis of the proposed changes consists of a downward revision of what were previously considered minimum spares stocks required at USAF bases and cutting down supplies in the pipeline (from manufacturer to depots to bases) by using air lift for needed parts in the "high dollar" bracket. This should further result in lower annual budget requirements for spares and probably will also reduce the percentage of initial spares ordered with new aircraft.

The new method was tested to the satisfaction of the Air Force at the Oklahoma City Depot on forms and procedures for Boeing B-47 high-dollar items. It was found that recomputation of B-47 requirements resulted in a saving of \$18,000,000 on that one program. An additional \$35,000,000 saving was made in the cancellation of jet engine buckets, wing tanks, and nozzle diaphragms. Total: \$53,000,000.

The group reported that the base spares stock level can be reduced by 15 days supply with a resulting reduction of 11% in pipeline engine requirements. There is also a study under way to reduce spares requirements by lengthening overhaul time through a minor repair program.

Release of the Aircraft Spares Report by the Air Force was brought about by Senator Homer Ferguson (R., Mich.), who acknowledged the projected results were a step in the right direction, but he indicated that the Armed Services Appropriations subcommittee, which he now heads, will maintain a continuous review of the Air Force's progress in this field.

### NEWS BRIEFS

Faster handling of air-ground communications is promised by a new type of magnetic tape recorder which has been put into service at Harrisburg, Pa., by TWA. Service tests showed ground operator could handle five times as many contacts when using the tape.

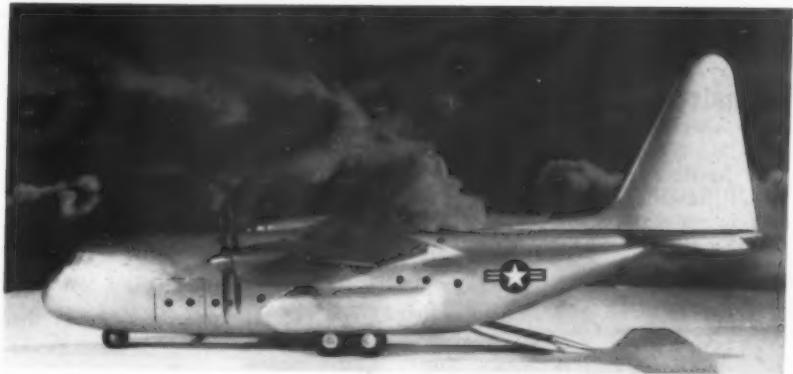
The DC-3 recently purchased by California Central Airlines came from Los Angeles Air Service, which had bought five of the planes from TWA last October. Bonanza also bought a DC-3 from LAAS.

The Hughes Tool Co. has increased its holdings in TWA by 263,100 shares, bringing its total to 2.5 million shares, according to the Securities and Exchange Commission.



MODEL OF LOCKHEED C-130 shows fender into which wheels retract. Designed as troop carrier or assault freighter, it can also serve as hospital plane.

## Turboprop C-130: the Wraps Come Off

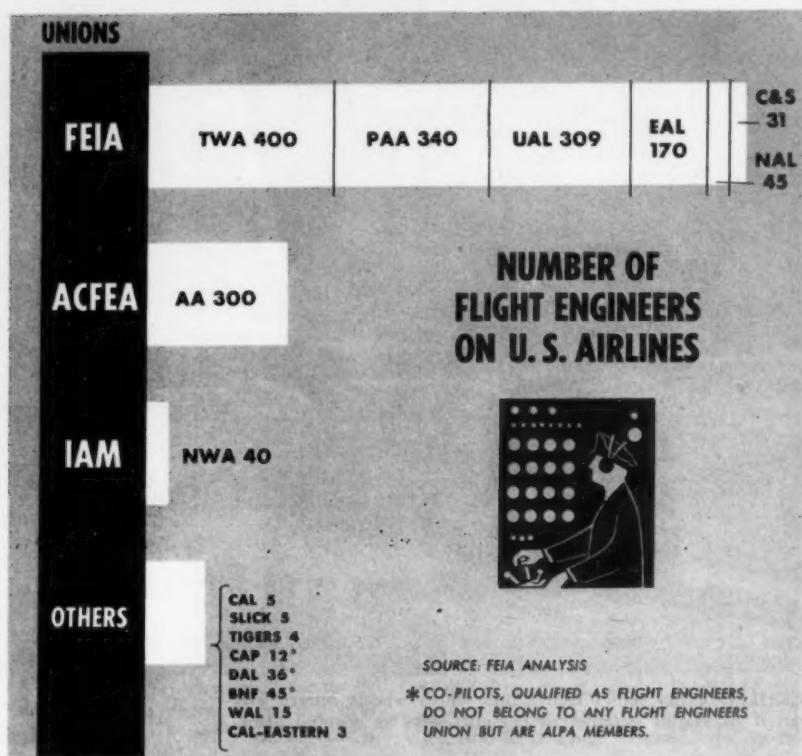


HEIGHT of C-130 is 38 feet, span 132 feet, length 95 feet. Main wheels are arranged in tandem for operation from short, rough fields. Entire fuselage, 45° off ground, will be pressurized. Power plants, not yet announced by Lockheed, will be T-53, each rated at 3,750 hp.



FAST LOADING will be possible with rear cargo door which lowers to form ramp, so that vehicles can drive into the C-130, or which can be extended horizontally to form a loading dock at truck-bed height. Quantity production order has gone to Lockheed-Marietta.

## How the Unions Stack Up



## Flight Engineer Membership Scrap Due

**FEIA, now the largest union, has big ideas about becoming bigger; there's going to be a fight.**

By ROBERT M. LOEBELSON

**A**JURISDICTIONAL dispute over which of three AFL unions is to represent the nation's flight engineers is believed to be a certainty. The annual meeting of the Flight Engineers International Association in New York has just resolved to make every attempt to represent flight engineers now bargained for by two



Kent

other unions, and it is expected that the International Association of Machinists and the Air Carrier Flight Engineers Association (an Air Line Pilots Association affiliate) will not give up without a struggle.

Here's how the three unions break down:

- **FEIA now has about 1,000 members**—about 400 on Trans World Air-

lines, 340 on Pan American World Airways (including 65 not yet integrated on one seniority list from American Overseas Airlines), 309 on United Air Lines, 170 on Eastern Air Lines, 45 on National Airlines, and 31 on Chicago & Southern Air Lines.

- **ACFEA represents more than 300 flight engineers on American Airlines.**

- **IAM bargains for about 40 flight engineers on Northwest Airlines.**

William D. Kent, president of FEIA, believes that winning bargaining rights at NWA will not be much of a problem, implying that the only reason Northwest's flight engineers did not join FEIA in the first place is because they retain seniority rights as mechanics as long as the Machinists remain the recognized bargaining agent.

Kent insists the flight engineers on NWA's Boeing Stratocruisers are more than willing to join FEIA and adds that IAM president Al J. Hayes might not object too violently to giving up 40 members.

IAM spokesmen said, however, that the Machinists would fight all attempts by FEIA to take over representation of the third men in Northwest's 377's.

In the case of American's flight engineers, it is safe to say that there will be a fight to prevent FEIA "raiding." When FEIA was first chartered by the AFL on December 7, 1948, David L. Behncke, then ALPA president, objected to William Green without success because Behncke felt ALPA and its affiliates should represent all flight personnel.

The situation has not improved much since then, and a flight engineers strike against EAL only served to make the dispute more acute. FEIA is smarting, not because ALPA pilots crossed their picket lines, but because the pilots allegedly said to Eastern, "Give us any qualified engineers and we'll fly the Constellations." EAL's FEIA members and the FEIA itself will not quickly forget that Eastern's pilots, members of a sister AFL union, were so ready to help break the strike.

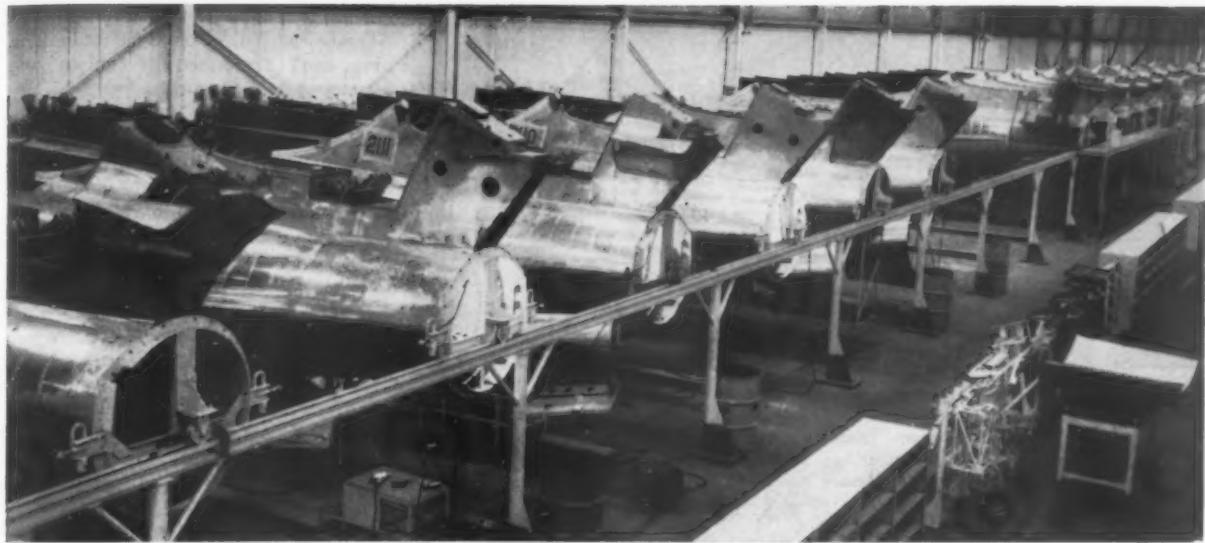
One other reason for the FEIA-ALPA feud is the fact that both unions want their members to be the second highest paid men on an airplane. Historically, flight engineers have ranked second to captains in pay, but ALPA has always felt that co-pilots should have that position.

FEIA's master executive board meeting also resolved that organizing drives would be made to sign up unrepresented flight engineers on both scheduled and non-scheduled airlines as they receive aircraft which require a third man in the cockpit.

Informed FEIA sources report, however, that three lines (Capital with 12 flight engineers, Braniff with 45, and Delta with 36) are safe from organizing attempts, for the time being at least. That is because the flight engineers on those carriers are co-pilots qualified as flight engineers. These men are on ALPA's seniority list and thus are temporarily "untouchable" by FEIA.

FEIA feels it is ready to embark on this expansion program because of its success in buttoning up two new contracts with Eastern and United which provide that members will be paid on the basis of increasing flight speeds and mileage flown rather than straight monthly salaries. Wage negotiations are now in progress with Pan Am on this same point and PAA is reportedly willing to go along with such a proposal, the chief issue being the amount to be paid. Negotiations with C & S are just about to get under way.

• • •



MOVING INTO PRODUCTION as a second source for the McDonnell F3H Demon carrier-based jet fighter for the Navy, Temco also produces major assemblies for Boeing's B-47 (above), Douglas' A2D, Lockheed's P2V, Martin's P5M.

## Temco: Fast-Moving Newcomer from Texas

In the last seven years the firm has jumped from nowhere to a backlog of over \$245 million.

A RETIRING government aircraft production official last week was asked to list the aircraft companies and their executives with unusually good production records since Korea. His first answer was, "Well, that Scot down in Dallas is certainly near the top of the list."

The Scot he was referring to is Robert McCulloch, 48, Scottish-born president of Temco Aircraft Corp., a company which was started as a limited partnership just over seven years ago. Today McCulloch and his aides have brought Temco to a point where it has been described as "the fastest growing aircraft company in the industry."

A recent Munitions Board report, for example, showed that Temco and its wholly owned subsidiary, Luscombe Airplane Corp., received prime defense contracts totaling \$92,900,000 from the Defense Department during the first two years after Korea, enough to place the company 87th on the list of top defense contractors.

Temco's most recently issued financial report indicates that as of last September 30 the company had a backlog of \$245,600,000. Forthcoming is a report which is expected to show a substantial increase in Temco's backlog figure, for the Dallas firm received a substantial second letter of intent to produce McDonnell F3H Demon carrier jet fighters last October.

But where did Temco come from and what has it done to earn the aircraft production official's accolade?

After Japan surrendered and the aircraft industry faced its perennial contraction, North American Aviation decided to pull out of its Dallas plant, which had turned out T-6's, F-51's, and B-24's during the war. Two NAA executives, McCulloch, manager of NAA's Texas Division, and H. L. Bert Howard, the division comptroller, decided the plant should not be shut down completely and started a campaign to convince Dallas businessmen.

As a result, in November, 1945, Texas Engineering & Manufacturing Co. was founded as a limited partnership with a capital of \$250,000, about 30% put up by McCulloch, Howard,

and other former NAA supervisors, the remainder by local businessmen.

First orders the new company received were from Fairchild Aircraft Division—one for the F-24 personal plane, the other for bottom panels for the C-82. Shortly thereafter Temco signed a contract to turn out 1,000 Swift personal planes for Globe Aircraft Corp. in Fort Worth.

About this time, the company changed from a partnership (which made McCulloch and Howard personally responsible for any debts Temco might incur) to a corporation.

The contract with Globe almost put Temco out of business, for Globe went bankrupt in 1946, leaving Temco on January 1, 1947, with bank notes of more than \$800,000, accounts payable of \$875,000, and a capital deficit of \$9,702. But Temco's creditors decided to go along with McCulloch and his team

### How Temco Has Grown

Year	Net Worth On January 1	Average January Employment
At Incorporation (April 29, 1946)	\$375,000	592
1947	\$415,000	799
1948	\$786,000	609
1949	\$1,137,000	2,553
1950	\$1,903,000	1,054
1951	\$2,224,000	3,524
1952	\$2,747,000	6,159
1953	\$3,700,000 (est.)	6,852



FOUNDING TEAM of Temco Aircraft in 1946 included (left to right) H. L. Bert Howard, now executive vice president and treasurer as well as president of the subsidiary, Luscombe Airplane Corp.; John A. Maxwell, Jr., vice president-manufacturing; and Clyde Williams, vice president-comptroller. All three and Temco president Robert McCulloch were associated with North American Aviation's Dallas plant, now Temco's home facility, during World War II.

(including John A. Maxwell, Jr., now vice president-production, and Clyde Williams, now vice president-comptroller). Temco took over Globe's rights, tooling, and other assets, including 300 completed but unpaid for Swifts.

Temco, however did not attempt to limit itself to aircraft work during the industry's "down" years between World War II and Korea. Former aircraft workers were assembling tractors and making vending machines, venetian blind clips, tire chain jacks, chart boards, structural steel docks for the Consolidated Vultee B-36, and truck bodies.

Some aircraft jobs did come along. Just after Temco was founded an aircraft broker asked the company to convert some Douglas C-47's for a non-scheduled airline. Additional overhaul, modification, and conversion jobs on civilian aircraft followed and in 1947 the Air Force asked Temco to undertake modifications of a number of planes, including 68 B-25's.

Several foreign governments followed the USAF's example and finally Temco obtained contracts to recondition AF C-54's. By the end of 1948 the company was reconditioning Skymasters for the Berlin Airlift at the rate

## The Man Behind Temco

BORN in Dumbarton, Scotland, Temco president Robert McCulloch started out to be a marine engineer but after completing his apprenticeship with Matthew Paul & Co. in his home town in 1924, he joined Beardmore Naval Construction of Dalmuir, Scotland, as a foreman in the aircraft division.

Coming to the U. S. in 1927, Bob McCulloch joined Atlantic Aviation Corp., Teterboro, N. J., as a production foreman. Atlantic subsequently became Fokker Aircraft, General Aviation, and later North American Aviation, and during the 14 years after going on Atlantic's payroll, McCulloch rose to the post of factory manager. When he left North American in June, 1941, he was named general manager

for Consolidated Vultee's Nashville Division.

Two years later McCulloch rejoined NAA as director of quality control for all of its plants, including the home facility at Inglewood, Calif., and the Texas and Kansas Divisions. Three months later he became assistant general manufacturing manager over all North American plants.

Transferred to Dallas as manager of the Texas Division in January, 1945, McCulloch stayed with NAA until the plant was closed down after the war. He and H. L. ("Bert") Howard then became partners of Texas Engineering and Manufacturing Co. and leased the 1,500,000 square foot facility. The firm's name was changed to Temco Aircraft Corp. a year ago.

of 25 a month. It was estimated that Temco did half of all C-54 reconditioning work performed by civilian companies during the airlift.

In 1947-48, Temco, deciding that the time might be ripe to re-enter the personal plane field, reintroduced the Swift under its own name and started development of a military trainer version, the T-35 Buckaroo.

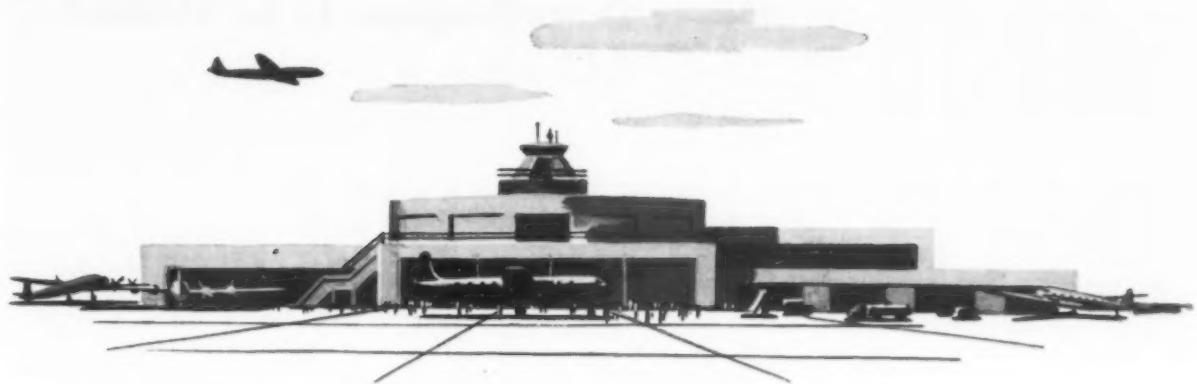
By 1949, as overhaul contracts for the USAF and foreign governments continued, McCulloch started a drive to obtain military subcontracts. Among the companies which awarded parts and components contracts to the Dallas company were Boeing, Convair, Chance Vought, Chase, and McDonnell. Toward the end of the year McCulloch offered to take over Luscombe Airplane at Garland, Tex., a company then in receivership as a result of being unsuccessful in selling the Silvaire personal plane. This reorganization was finally consummated on March 31, 1950.

With Korea, and the subsequent rapid demands on the aviation industry generally, Temco started becoming an even more important part of the defense effort. First the C-54 overhaul program was stepped up and Temco was told to overhaul 200 F-51's. Then came a Boeing contract to build rear fuselage sections for the B-47. At the same time Luscombe stopped personal plane work and converted to making assemblies for the B-36. About this time the Air Force also ordered three T-35's for evaluation.

Early in 1951 Lockheed came through with a contract for outer wings for the P2V Neptune, Douglas followed with a request for wing panels, surfaces, center sections, and other assemblies for the turboprop A2D Skyshark, Martin asked for flaps and bomb bay doors for the P5M Marlin flying boat, and Boeing's B-47 contract was increased to include all fuselage installations as well as the bare airframe.

Meanwhile, Temco's reconditioning work on C-54's continued and 30 of the planes were converted to the C-54M hospital-ship configuration after consultations with the Military Air Transport Service. The F-51 Mustang evolved as a two-place TF-51 trainer as a result of Temco engineering studies. A contract to rehabilitate F-47 Thunderbolts and modifications on Coast Guard C-54's also followed.

By June of 1951, however, it became apparent that the Dallas plant would have to be devoted basically to aircraft manufacturing and over haul work would have to move elsewhere. Accordingly, Temco signed a contract with Greenville, Tex., and transferred its reconditioning operations to Majors Field there, a former USAF training base. This facility, incidentally, may



## CHAMPION SALUTES THE AIRLINES

*for the best safety record in history!*

The nation's airlines set new all-time records in passenger traffic and in safety of air travel for 1952. This is a magnificent tribute to airline maintenance methods and personnel.

It has been the privilege of the Champion Spark Plug Company through its engineers to work closely with the engineering and maintenance staffs of every major airline.

Whatever part Champion Spark Plugs have contributed to greater flying safety is attributable in large measure to the wholehearted cooperation of airline and aircraft engine manufacturing personnel with each other and ourselves. Nowhere is this more evident than in the annual Aircraft and Ignition Conference, sponsored by Champion, which has become the standard of the industry for cooperative effort towards a common goal!



*The RC26S and R37S-I are the most widely used of Champion's many types of aircraft spark plugs.*

CHAMPION SPARK PLUG COMPANY, TOLEDO 1, OHIO

MARCH 2, 1953

soon be expanded to include not only military and airline work but overhaul and rehabilitation services to corporate and executive aircraft as well.

Despite Temco's success in lining up subcontracts, McCulloch was convinced the company should be producing its own complete airplane. Although the order for three T-35's was followed only by a limited order (in December, 1952) for the Buckaroo for Mutual Defense Assistance Pact nations, he still has hopes that more of the trainers will be purchased by the Air Force.

When the USAF's jet trainer competition was under way (Cessna has since been awarded a development contract for its Model 318), Temco was one of the seven companies which submitted a total of 15 designs. That attempt, while unsuccessful, has set Temco engineers to thinking more about basic aircraft design and several projects, including some for combat jet aircraft, are now on the drawing boards or ready to be proposed.

If and when Temco does succeed in selling the military on one of its aircraft designs, it will have more than just construction of the Swift and T-35 behind it experience-wise. Although a McCulloch attempt to become a second source for one of the Navy planes for which it is building components did not pan out, McCulloch was successful in convincing Navy that Temco should become the second producer for the McDonnell F3H swept-wing, single-jet Demon. A first F3H contract awarded last August was followed by a letter of intent in October before tooling was very far under way.

The team of ex-NAA supervisors with which McCulloch has surrounded himself includes:

• **Bert Howard**, 58, formerly with Goodyear Tire & Rubber as industrial engineer, general auditor of Glidden Co., comptroller-treasurer of Samson Tire & Rubber in Los Angeles, division comptroller for NAA at Dallas, and now executive vice president and treasurer for Temco and also president of Luscombe.

• **John A. Maxwell, Jr.**, formerly manager of Follmer Clegg & Co., at one time the world's largest umbrella maker, later Texas distributor for DeWalt products, maker of woodworking equipment, then manufacturing coordinator for NAA-Texas, and now Temco's vice president-manufacturing.

• **Clyde Williams**, formerly accountant for Dallas Power and Light Co., later credit manager for an automobile agency, subsequently an accountant with Ernst and Ernst, the chief accountant for NAA's Texas Division, and now Temco vice president-comptroller.

## Heavy-Press Program to be Slashed

The Air Force's heavy-press program, calling for the delivery and installation of 17 large forging and extrusion presses within the next couple of years to speed aircraft production, is about to be drastically reduced by the Eisenhower Administration, according to usually reliable reports.

Air Force officials handling the program have denied to AMERICAN AVIATION that a reduction is about to occur, but Charles E. Wilson, Roger M. Kyes, and Harold E. Talbott, all former businessmen, are said to have made up their minds that:

• **Seventeen presses** with capacities ranging up to 50,000 tons cannot be purchased and housed with the \$389 million Congress has approved.

• **It is debatable** whether the USAF and Navy and their contractors in the aircraft industry would make full utilization of these presses if they should be completed.

USAF officials monitoring the press program told AMERICAN AVIATION that the money authorized would permit completion of all the heavy equipment and that "we know exactly how to use the presses," but they are admittedly not in the know on what the new Defense Secretary and his colleagues are planning.

One persistent report is that the 17 presses now scheduled will be re-

duced to exactly two, one to handle aircraft forgings, the other for extrusions. In any event, it is reliably reported that the entire program is now being reviewed to determine how much it will be reduced.

Congress apparently will not provide any more money to purchase the presses and the buildings to house them. When \$210 million was appropriated in the summer of 1950, it was supposed to be enough to purchase 20 presses, but the Air Force soon discovered it would only buy about half that many.

USAF officials subsequently came back with a revised program which, they said, would cost \$389 million in all. In approving that amount, Congress warned the Air Force that \$389 million was the limit and that no further amounts would be approved. The fiscal 1954 budget submitted by ex-President Truman in January contained no request for additional funds.

It is evident that the Wilson-Kyes-Talbott combination, in helping President Eisenhower and Budget Director Joseph Dodge draw up a revision of the 1954 budget which is to be submitted piecemeal this spring, will not urge any further money for heavy presses at a time when the Administration is trying to reduce expenditures. • • •

## Aircraft Production Board Wiped Out

For the first time in nearly two years last week, aircraft companies confronted with production problems had no "court of last resort" to which to turn for help. The Aircraft Production Board, an integral part of the Defense Production Administration since its inception in the spring of 1951 and an agency which had helped virtually every company in the industry to speed up production by finding scarce machine tools, went out of existence in a streamlining move by the Office of Defense Mobilization.

Out with APB went Allen C. Rankin, special assistant, who moved in when Harold R. (Bill) Boyer, then and now a General Motors Corp. vice president, took over as APB chairman in July, 1951. When Boyer returned to GM last fall, Rankin stayed on and in effect became APB's top man, although a succession of DPA deputies (including William L. Campbell of "Campbell Report" fame) held the title of acting APB chairman.

Rankin resigned last week as the board's functions were shifted to an ODM Production Executive Committee, to be made up of representatives of the Army, Navy, Air Force, Defense Department, Atomic Energy Commission, National Production Authority, and Munitions Board.

While the PEC was destined to take over APB's job and some APB troubleshooters (notably USAF Col. Samuel Hale and Navy Bureau of Aeronautics Capt. Nichols Rowinski, on loan from the military) would probably remain assigned to the new set-up, the aircraft industry would not find the service it had received in the past.

Aircraft firms facing an unexpected shortage of materials or a requirement for a special machine tool in a hurry or a lack of aircraft components would continue to seek help first from such panels as the Munitions Board's Aircraft Production Resources Agency at Dayton, but no APB would stand behind APRA to help out. • • •

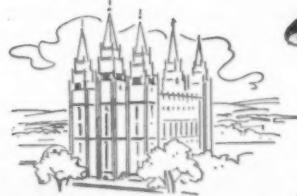
Western proudly announces  
its new direct route!

# ONE-STOP DC-6B's

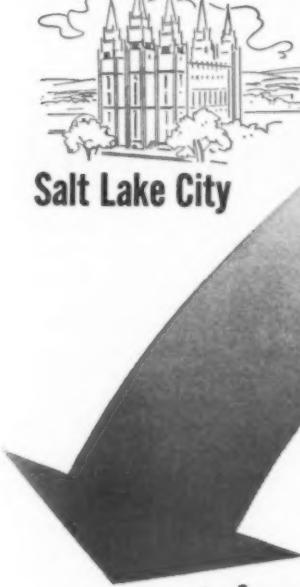
## between MINNEAPOLIS-ST. PAUL and LOS ANGELES



Minneapolis-St. Paul



Salt Lake City



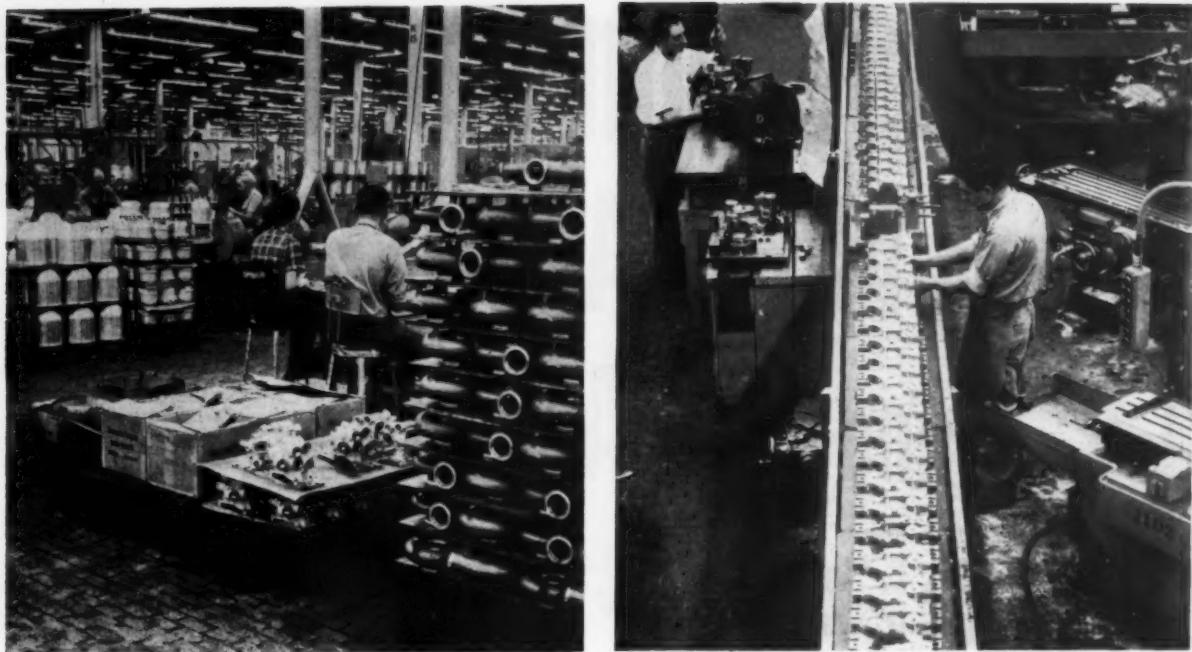
Los Angeles



WESTERN'S DC-6B is the most advanced version of the world-famous Douglas airliners. One of the major new features your passengers will like is the super-pressurized cabin—most comfortable ever developed.

# WESTERN AIR LINES

AMERICA'S OLDEST  
FLIES AMERICA'S NEWEST



**TWO TYPES OF PRODUCTION** are running side-by-side at Hamilton Standard. On the left are the 34E60 prop spinners scheduled to be used on the DC-7. Stacked on the right are air conditioner turbine housings, the first of the division's new items in the equipment field. In the picture on the right, jet fuel control castings and afterburner actuator castings roll down the production line at Windsor Locks.

## Ham Standard Swings Toward Equipment

**Accessory production will equal propeller work within five years under new program.**

**WINDSOR LOCKS, CONN.**—Hamilton Standard division, United Aircraft Corp., has made a major policy decision to enter the aircraft equipment field and within five years plans to hike its present production ratio of 10% equipment items and 90% propellers to 50% equipment and 50% propellers.

Present planning, according to Hamilton Standard's general manager, Erle Martin, calls for further expansion of production of the four equipment items already being made at the division's new plant here:

- Air cycle refrigeration and/or air conditioning units for military fighters;
- Jet fuel controls, as now employed on the J57;
- Jet engine starters, as used on the B-52, the YB-60, and "another late model fighter";
- Main hydraulic pumps, as on the F7U-3.

"Just because we are minimizing the emphasis on propeller production and concentrating on the profitable equip-

ment field does not mean that we think the propeller is due for complete abandonment," says Martin. "It merely means that we feel that the propeller market in this expanding jet age is becoming restricted. But it is very possible there will be a renaissance of propeller-driven aircraft in the transport field after the jet urge dies down."

As far as speed is concerned, Martin thinks that turboprop-driven aircraft are feasible for speeds up to Mach 0.9 and that efficient propellers could be built for speeds up to Mach 1.4. After that, complexity would boost costs too high.

The current advanced propeller designs of this 35-year-old company are the products of engineering which have made Hamilton Standard a byword in propellers and constant speed governing. During World War II, more than 75% of all propellers installed on U.S. bombers, fighters, advanced trainers, and transports were provided by the division and its licensees. The company achieved this position while basing its main design trends on hydraulic-mechanical sys-

tems rather than electrical systems. It has continued this hydromechanical design practice in the construction of its new equipment line.

The first equipment item to be undertaken was the air conditioning unit. The heart of the machine is a turbine wheel small enough to fit in the palm of your hand. It revolves at 60,000 revolutions per minute to cool the air to be supplied to the cockpit. Weighing 20 pounds and measuring 12" x 22½" x 17", the unit delivers a 120 miles per hour blast at anywhere from 30° F. to 215° F. into the fighter's cockpit to change its 60 cubic feet of air every 15 seconds. When set at full cold, the unit has the freezing capacity to make some 130,000 ice cubes a day. The first sizable order of these units was for use on the F-86D.

Air at 620° F. is bled from the main turbine; it passes through a heat exchanger, coming out at 215° F.; it goes into the three-inch refrigerating turbine wheel, where it does some 30 hp of work, thereby dropping to 30° F.; it is then ducted to the pilot.

A cutoff valve can shortcut the 215° F. air around the turbine and feed it into the cockpit supply line in any

*"Straight up" bat-wing interceptor  
lands with ease on aircraft carriers*



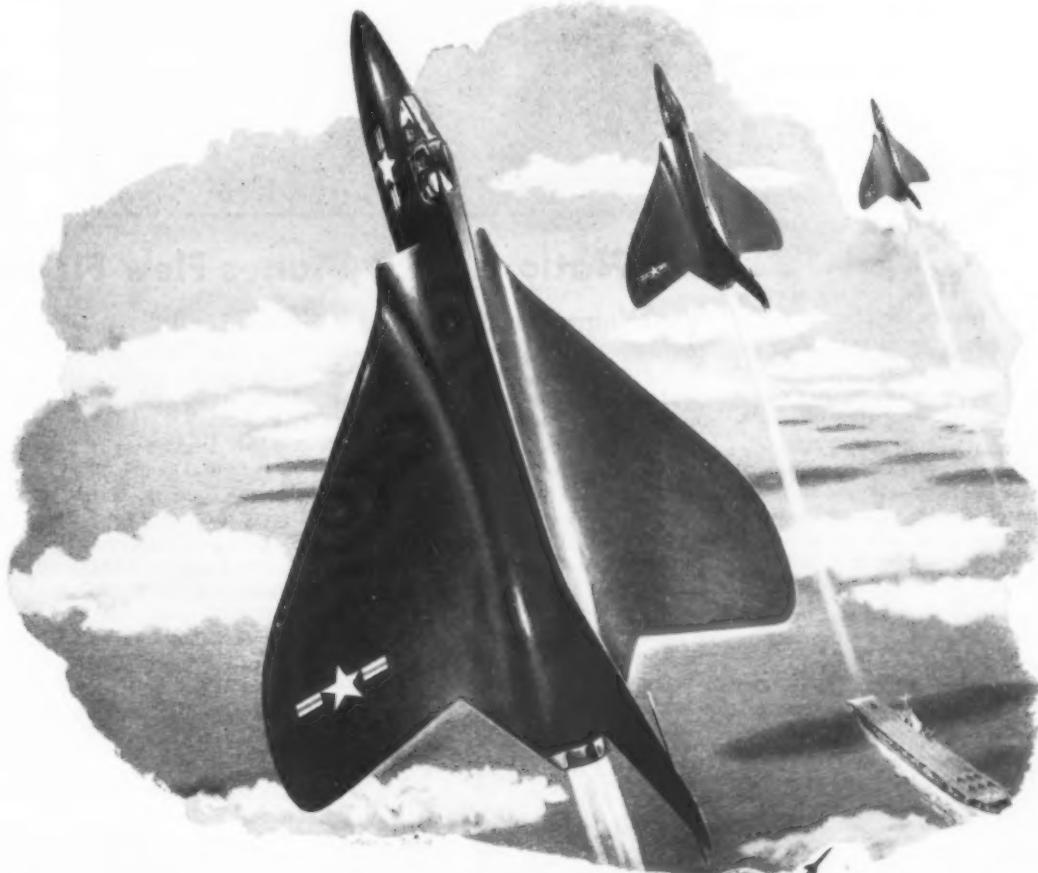
## — the Douglas F4D Skyray

Problem: to find a Navy interceptor to operate from aircraft carriers and meet the threat of today's fast jet bombers. Answer: the Douglas F4D Skyray.

With its mighty power plant and radical swept-back wings, Skyray zooms into action at blazing speed. Minutes

after radar warning, it's off the deck and on station—ready to intercept approaching aircraft with a lethal load of bullets and rockets. Yet for all its power and speed, this agile interceptor lands at low speeds—is perfectly adapted to requirements of present carriers.

Performance of the U. S. Navy's F4D Skyray is another example of Douglas leadership in aviation. Developing both military and civilian planes that can be produced in quantity—to *fly faster and farther with a bigger payload*—is the basic rule of Douglas design.



Depend on **DOUGLAS**



First in Aviation

proportion selected by the pilot, thereby providing him with air anywhere from 30° F. to 215° F.

The second flow system in this unit completes the operation. The cooling medium going through the heat exchanger is the outside air, which is pumped by a fan directly connected to the refrigerating turbine wheel. It is pumping this outside air with the fan that absorbs the 30 hp of heat energy.

Of the second Hamilton Standard equipment product, not much detailed information can be given, for security reasons. It is a gas-turbine fuel control device, combining an electronic brain with hydro-electric power. A highlight of the new control is its accuracy as a governor of the turbine wheel; it is capable of maintaining the desired speed at within plus or minus one quarter of one per cent.

#### Fuel Control

The increasing high powers of gas-turbine engines make fuel control difficult for a pilot already occupied with the physical problems of flying a high speed airplane. In order to achieve maximum efficiency, the turbine engine must operate at close to its critical limits of power and strength. The new control governs turbine-wheel speeds and restricts the amount of fuel admitted to the combustion chambers when the engine's operating temperatures rise, by direct "sensing" of the engine's speed and operating temperatures.

Generating its own source of electric power, the unit uses a system of vacuum tubes, resistors, condensers, and thermocouples to read the engine's speed, the temperature of the air entering the engine, and the tailpipe temperature.

Any tendency by the engine to exceed its limits is promptly met by the electronic unit with a signal which causes a reduction in the flow of fuel to the engine.

Actual fuel flow, which is controlled by a throttle valve, is determined by the movement of a pilot valve in response to the application of voltage to a proportional solenoid—one whose armature position varies with impressed voltage.

The hydraulic unit of this fuel control executes the orders passed on by the electronic unit. In addition, it performs extra functions to prevent the engine from exceeding its operational limits. It measures the air pressure in the compressor section and establishes a proportionate flow of fuel to the engine at such a level as to prevent lean blowouts at such times as deceleration.

In the event that air pressures are building up to the design limit, it limits the flow to the engine, thus curtailing engine speed, temperature, and compressor pressure.

Hamilton Standard's third equipment item, the jet engine starter, will deliver 100 hp, weighs 38 pounds, and will bring an engine up to its designed idling (starting) speed in about 20 seconds. It operates with a ground supply of compressed air fed at 1,200 mph through a three-inch inlet to a seven-inch turbine wheel.

As the starter turbine rapidly picks up speed, its torque is delivered through a system of gears to a clutch jaw. The jaw then meshes with a set of gear teeth on the starter output shaft. A direct spline connection of the output shaft and the engine starter completes transmission of the power to the turbine.

When the main turbine is turning at about 1,000 rpm fuels can be introduced, and when the speed gets up to 45,000 rpm for the starter, the starter automatically turns itself off by a centrifugal switch. Starter rotation ceases and the starter clutch gear moves backward, disengaging itself from the output shaft.

Hydraulic engineering experience of the division was put to work on the fourth of the new equipment products, a main hydraulic pump.

Here Hamilton Standard made a nine-inch-long pump of less than nine inches in diameter, weighing 18 pounds, to transfer approximately 36 hp to actuate an airplane's major control surfaces or other components.

Pressures as high as 3,000 pounds per square inch, operating speeds of 8,250 rpm, and automatic regulation of oil flow to conform with variations in

the airplane's power requirements are present in this item built to project power from one convenient location in the aircraft to the operating components at the smallest cost in the weight system.

It has been estimated that a group of these pumps installed in place of several units previously used saves at least 40 pounds in one typical aircraft installation.

These are the first four entries of Ham Stan in the equipment field. They do not fill the division's complete horizon. The general field of pneumatics very much interests the division, and it hopes to extend the knowledge and know-how it gains with its starter and spread it into other new units to provide auxiliary turbine power for alternators (generators).

Martin cannot talk about the other equipment items under design at present in very specific terms, but he will say that the division is working on a combustion starter which would run on jet fuel and air and another starter using propyl-nitrate. The division is also producing power packs for "a guided missile." The pack burns and generates the electricity and hydraulic power for the missile.

Martin could not say which of these presently classified programs might serve as a new field of concentration during the equipment expansion program of the next five years, but he felt sure the division could establish itself firmly in its new endeavor.

• • •

## Six Nations, 220 Planes Flew Flood-lift

THE BIG RESCUE and supply-dropping role played by aviation during the recent floods in Holland is pointed up by the number of aircraft involved—220. Particularly valuable service was rendered by 32 helicopters of six nations in rescuing people from trees and the roofs of houses in flooded areas. Over half the helicopters were supplied by the USAF, which dispatched 18 machines (Sikorsky S-51 and S-55, and Bell 47 models) to the disaster zone. Britain's Royal Navy sent seven rotorcraft (Sikorsky S-51's); Sabena Belgian Airlines, three (Bell 47's); France, two; Switzerland, one; and the Dutch Navy, one. The USAF alone rescued 625 people by helicopter.

The eight amphibians employed in rescue work demonstrated how useful aircraft of this type can be to flooded areas. The Dutch Navy operated three Supermarine Sea Otters; the USAF, two Grumman SA-16's; and the Danish authorities sent three Convair PBY's.

On supply-dropping missions be-

tween February 1 and 7 aircraft made some 412 flights, dropping 855 tons of badly needed equipment and food. The USAF alone dropped 460 tons. The aircraft taking part in this operation included: USAF—eight Fairchild C-119's and four Douglas C-47's; RAF, two Vickers Valettas; Dutch Navy, two Airspeed Oxfords, three North American B-25's, six Lockheed P2V's, and two Fairey Fireflies; KLM Royal Dutch Airlines, four C-47's; Dutch Air Force, four C-47's, two de Havilland Dragon Rapides, and some Beechcraft T-7's; Prince Bernhard flew a Siebel Si 24; Fokker sent the prototype S-13 twin-engine trainer; and the Dutch government flying school supplied 10 Beechcraft D18S's.

Furthermore, many light aircraft were supplied by the USAF and Dutch Air Force for reconnaissance. The entire flooded area was photographed by KLM survey planes to aid in repair and reconstruction work.

• • •

## What's New at AiResearch



The induction generator is not new. What is new is the skill of AiResearch engineers in developing an AC generator *so small... so light... and so efficient that it can be airborne!*

Designed for use in missiles and planes, this new AiResearch AC generator is the only one of its kind in *quantity* production. Simple and rugged in construction, it can be used for 5 years. Thus it can replace

bulky, heavy, short-lived batteries.

Following are some of the characteristics of the new AiResearch AC generator: **COMPACT:** 4½ lbs., 800 watts, 115/200 volts, 3 phase, 400 cycles; **RUGGED:** will withstand 50 g shock and 40 g acceleration by actual test; **NO ALTITUDE PROBLEM:** no brushes — tested to 50,000 feet; **SIMPLE:** designed for mass production — no critical nickel or cobalt;

**MINIMUM AUXILIARY EQUIPMENT:** needs only simple capacitor — no complicated voltage regulator or DC exciter.

Once again this unit demonstrates the ability of AiResearch engineers to design and manufacture small, light weight, precision equipment vital to high-speed, high-altitude flight.

**Would you like to work with us?** Qualified engineers, scientists and skilled craftsmen are needed here.

## AiResearch Manufacturing Company

### **A DIVISION OF THE GARRETT CORPORATION**

LOS ANGELES 45, CALIFORNIA • PHOENIX, ARIZONA

DESIGNER AND MANUFACTURER OF AIRCRAFT EQUIPMENT IN THESE MAJOR CATEGORIES





**AVIATION PROGRESS MARKED**—Here at Kitty Hawk, N. C., the aviation world recently paid tribute to the Wright Brothers for their achievement of powered flight

in a heavier-than-air machine in 1903. And among the aviation pioneers taking part was Igor Sikorsky, whose aircraft have made a major contribution to air progress.

## AROUND THE WORLD WITH THE FLYING JACK-OF-ALL-TRADES



**ROTARY-WINGED PACK TRAIN**—Airlift of vital construction materials, key personnel, and survey teams is routine on the Aluminum Company of Canada's vast smelting and power development project in the rugged Kitimat region of British Columbia. In a few hours big Sikorsky S-55s, operated by Okanagan Helicopters, Ltd., can haul loads a mule trains would need days to deliver.



**EASY DOES IT**—A big H-19 Sikorsky carrying wounded men settles gently to the lawn in front of the Naval Medical Center in Bethesda, Maryland, ending a mercy flight which began on the battlefield. Regular transfer of Korea casualties arriving at nine military air terminals in the U. S. direct to service hospitals is planned by the Military Air Transport Service.



PILOT"—Ministering to the spiritual needs of men at sea is often difficult because of rough seas and the distance between ships in a fleet. But with helicopters such as the Sikorsky HO3S-1 shown above, chaplains can move from ship to ship with ease and come aboard by landing or by rescue winch.



## SIKORSKY AIRCRAFT

BRIDGEPORT, CONNECTICUT

*One of the Four Divisions of United Aircraft Corporation*

# Terminal Audience Gets Ear Bent, Broken

Pity the poor passenger tortured by mumbled messages that come too often and last too long.

By WAYNE W. PARRISH

**G**O TO ANY BUSY airline terminal these days and listen to the loudspeaker and you'll have a challenging, if somewhat frustrating, experience.

You will conclude after one hour of listening that loudspeakers at airport terminals have the following purposes:

• **Voice testing.** Why pay a radio school to train your voice? Ample opportunities at airports for free. Every airline employee gets a crack at the mike. Try out your voice slow or fast, loud or soft, high or low. Do a little ad-libbing of the routine departure announcements. You've got a wonderful captive audience just waiting to thrill at the very sound of your voice.

• **Substitute for telephone.** Why bother to call the ramp agent on the telephone? Just get on the mike so everybody else can hear, too. Better yell loud, too, so he'll be sure to hear you. By all means put a note of urgency into the call and repeat three times.

• **Crew round-up.** Don't worry about where the crews are. Maybe they're having coffee or just wandering around. You don't have to find them—just get on the mike and round 'em up. Pilots like to hear their names over the loudspeaker. Never can tell, they might have a flight going out sometime today. You can always squeeze in a call for crews between the arrival and departure announcements; in fact it's another way of plugging your airline.

• **Airline advertising.** Talk about a captive audience, an airport terminal is ready-made. Never refer merely to Flight No. 625, be sure to spruce it up with a description of some kind—the Gold Sparrow Service, the Moonliner Service, the Flagboat Service, or the Old-Type Galaxy Service. Where else can an airline get such free advertising? And by all means announce a departure at least three times; this gives the captive terminal audience (and the competition) the idea that your line has one helluva lot of departures.

• **Recognition for the under-dog.** Where else can a janitor get such recognition? Page him over the loudspeaker a half-dozen times and pretty soon he'll overcome his lowly station in life and start broadcasting himself. By all means arrange to page the janitor at least once each hour. And don't forget the airport cop. He waits for hours sometimes until he can catch a car il-

legally parked so he can rush to the mike and pour out his warning in a rasping hangover voice to the owner of a car with license number 7-6854 to move his vehicle at once. You'll soon conclude that the airport cops have the least chance to succeed as radio announcers, but what the hell, give 'em a chance to train anyway.

• **Mystery.** Don't let an hour go by without baffling waiting passengers with a mysterious call to "Mr. Whizzle, Dial 770" and repeat rapidly three times. (Wonder what Dial 770 really is?)

• **Don't overlook by any means the calling of individual passengers.** They love it, especially when they've been frantically trying to get the attention of the counter agent for fifteen minutes while standing in the back of a line at the counter with only five minutes to go before departure. It's usually a good idea to start calling for passengers a half hour before departure time; naturally the passengers are still on their way to the airport, but they may have friends in the terminal who are thrilled to hear the name of somebody they know come over the loudspeaker. This is also another way of getting your own airline before the captive audience.

It's really just like that at a busy airport these days. Just to make sure, AMERICAN AVIATION recorded by shorthand the actual announcements at Washington National Airport for a 50-minute period on a recent Tuesday afternoon.

In those 50 minutes there were 81 announcements.

Of these 81 announcements, nine had nothing to do with arrivals and de-

partures. They were calling ramp agents, the janitor, minor airline flunkies.

At one point the announcements came so fast that two were made at once and were, of course, unintelligible.

Thirty-one announcements were made calling for passengers to come to such and such an airline counter.

Out of the 81 announcements, 31 were for flight departures and eight for arrivals. In other words, less than half involved flights, and relatively few of the actual arrivals were being announced. Most departures were announced twice, but National, American, and Colonial each announced one departure three times.

Number of words used varied considerably. The record was held by Northwest with 37 words for one departure, although the same departure had been previously announced with only 35 words.

TWA was a close runner-up in wordage, but American, Eastern, Colonial, National, and Allegheny were doing pretty well with over twenty-five words each. Capital kept its arrival and departure wordage down, but out-did all others in paging prospective passengers, with eight pages in 50 minutes as against five each for TWA and Eastern and four for American. No other line paged more than twice.

With scarcely an exception—the one exception being American on some announcements—each airline described its special service such as Silver Falcon, Star, Starliner, Stratocruiser, Flagship, Mainliner, Capitaliner, New Type Constellation, and the like.

What it all adds up to is that a busy airline terminal these days is a babel of noise. Eighty-one announcements in 50 minutes saturates the air. Residents living near airports may complain about airplane noise, but their complaints are nothing compared to the complaints about loudspeakers inside the terminals.

Something can be done, and must be done, to reduce the number of announcements and to reduce the number of words per announcement. No one airline can afford to reform—it must be a joint agreement.

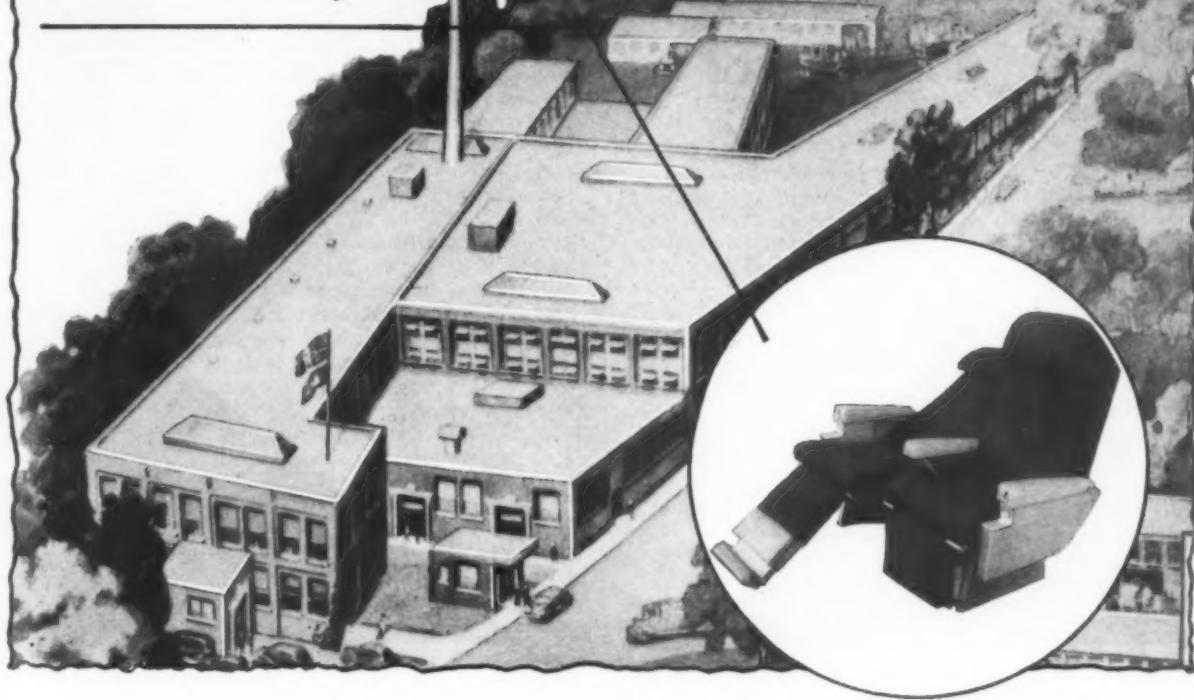
The 50-minute sampling took place at Washington National, but to a lesser or greater degree the same situation exists in every terminal in the country. An airport terminal should be as modern as the equipment that flies on and off the field and being modern in this instance means the simplest and most effective and least irritating method of announcing arrivals and departures and of paging that can be devised. Who will start the reformation? • • •



EVERYBODY gets into the act.

# AEROTHERM AIRCRAFT SEATS

*offer you luxurious comfort day and night  
... servicing is quick and easy anywhere!*



The most complete line of standard designs and new, improved aircraft seats is available to you now with reactivation of the Bantam plant (formerly Warren McArthur Corp.) by The Aerotec Corporation and The Thermix Corporation.

Your passengers ride confidently in Aerotherm Aircraft Seats. Each design combines the comfort and safety features proven most desirable by airline experience. These seats also have gained enviable records for easy, low-cost maintenance. An example is the Aerotherm Model 406D double passenger aircraft seat shown here. Seat and reclinable back (maximum

62°) are cushioned with body-fitting foam rubber for comfort day and night. This model, designed for use in DC-4 type aircraft, offers a choice of upholstery and finish to suit your taste. Frame structure is of strong, lightweight aluminum and magnesium alloys. Optional features include food tray brackets, leg rests, and life jacket pocket.

When faced with the problem of seating your next ship, consult our engineers who have had wide experience in serving other leading airlines. Write today for descriptive literature on Aerotherm Aircraft Seats.

#### FIELD PROJECT ENGINEERS—AIRCRAFT DIVISION

CLEVELAND 29, OHIO  
Jay Engineering Company  
Pearl Road

REDWOOD 2, CALIFORNIA  
Jay Engineering Company  
West Glensoks Boulevard

GREENWICH, CONN.  
John S. Hammond, Inc.  
45 E. Putnam Ave.

BALTIMORE, MARYLAND  
John S. Hammond, Inc.  
Stanley L. Manton  
Cromwell Ridge Road  
Loch Raven, Maryland

REG. TRADE MARK

SEATTLE 1, WASHINGTON  
John E. Freeman & Assoc.  
1529 9th St.

WICHITA 17, KANSAS  
John E. Freeman & Associates  
5401 East Kellogg

DAYTON 3, OHIO  
Jay Engineering Company  
1721 East Third Street

MONTRAL 25, QUEBEC  
Chomeday, St. 9812 May St.  
Toronto 5, Ontario 1440 St.  
Catherine St., W. Montreal 25,  
Quebec Canadian Affiliates

**THERMIX**

# THE THERMIX CORPORATION

GREENWICH, CONN.

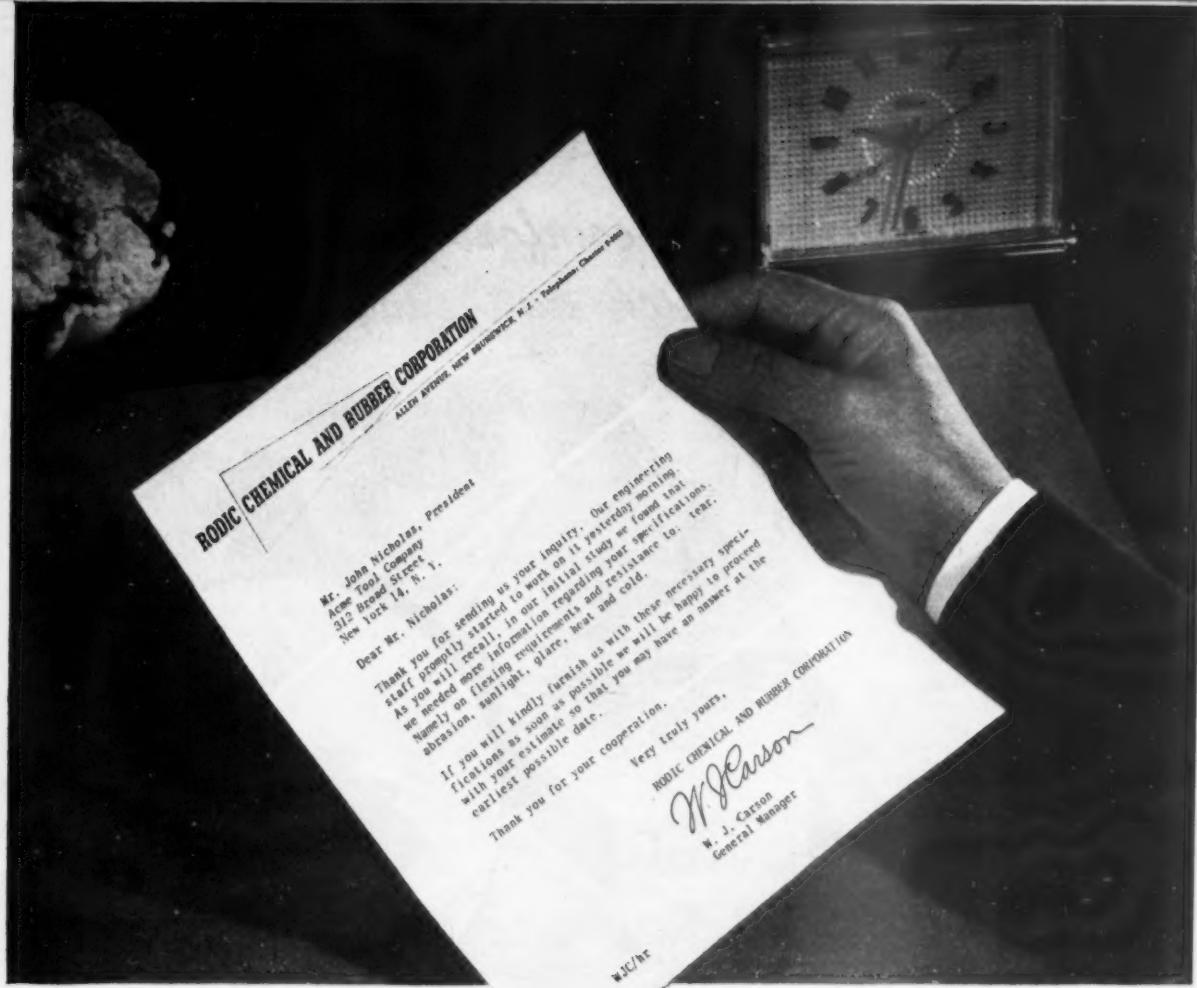
PROJECT ENGINEERS

**AEROTEC**

**AEROTHERM**

**HEACON**

**pd**



## *How to make a good impression in a 10-second appointment!*



One sure way is to have your business letter (your most important line of communication) typed on a Remington Electri-economy. You'll find the Electri-economy letter stands apart from all others. Its sharp, distinctively-uniform printwork commands attention, looks **IMPORTANT**. Wherever your letter goes it sells you and your air line on sight. Proof? See the Electri-economy in action today. Discover, too, how it steps up production of your carbon copy typing, flight and maintenance manuals, Management Reports, billing—in fact, all typewritten work.

**Remington Rand**

THE FIRST NAME IN TYPEWRITERS

For free demonstration or booklet "Take a Letter" (RE8499) write: Remington Rand, Room

315 Fourth Ave., New York 10, N.Y.

## Back to Cutting 'Fat,'—Or is it Muscle?

**D**EPUTY SECRETARY OF DEFENSE Roger M. Kyes, No. Two man in General Motor's Pentagon auxiliary, has delivered himself of a pronunciamento which may spell trouble for the aircraft industry and the military air power expansion programs.

Having devoted his entire 15 days service in the Pentagon to a thorough study of the military situation and the status of the defense mobilization program, Kyes (and probably his bosses) apparently became convinced that the fiscal 1954 budget could stand some trimming.

So, forthwith, he told the three military services to give their budget estimates a thorough going over and come up with some new figures, with an eye toward "intelligent savings," by February 28. Just what constitutes an "intelligent" saving was not made clear, but it is understood to mean any cut below a figure recommended by the Democratic Administration in the budget prepared last October. Since the Democrats were unable to do anything right during their 20-year tenure, obviously any budget they prepared must be considered suspect.

Thus, once again air power expansion becomes a political football. As in the days when Louis Johnson was trying to convince the public that he was an efficient administrator by hacking every appropriation he could get his axe on, it now appears that the Republican Administration is planning to endear itself to the public in the infancy of its long-awaited regime by coming up with a budget substantially under that prepared by the crew it deposed. Since no appreciable cut can be made without a heavy chop in the defense portion of the budget, it would appear that the air expansion programs are in for rough sledding.

The most worrisome item in Kyes' directive received little attention at the time the directive was issued, but it is very significant in that it hints at the possibility that the Administration may have already decided on a defense stretch-out or a cut in the approved goals as one method of reducing the budget. This was Kyes' statement that the services should "reassess the urgency of proceeding at the planned rates with the various programs."

If there has been any lessening of the urgency of defense mobilization it has not been apparent in international developments. The major urgency appears to be the necessity of vindicating the Republicans' pre-election economy demands.

As far as the military is concerned, the urgency has not abated one iota. It is very doubtful that the estimates will be revised to any great extent, for it has been repeatedly stated that the fiscal 1954 budget is a "tight" one and cannot be cut without altering the defense goals.

The task confronting the military is to "educate" the new top-level civilian officials in the Department of Defense, to try to bring them around to backing the budget as it now stands. One member of the new secretariat, Under Secretary of the Navy Charles Thomas, has already admitted that it appears to be a tight budget. Defense Secretary Charles E. Wilson himself is cautious about predicting large cuts.

If they fail to convince the new secretariat, or if the Administration persists in a budget cut anyway, one of two things may happen. There may be a new stretch-out, in which the defense goals, such as the 143-wing Air Force, will be maintained, but the target date for their attainment moved back six months or a year. It must be remembered that the money in the new budget will go partly for planes on the tail-end of the 143-wing expansion (1955 deliveries) and partly for "sustaining" aircraft, that is, replacement aircraft to keep the force modern after attainment of the goal.

A new stretch-out would have this effect, as far as a budget is concerned: it would permit a cut in the "build-up" aircraft money and at the same time move appropriations for a large portion of the "sustaining" aircraft back into the next fiscal year.

Since the next budget was scheduled to be lower than the current one anyway, this might be an acceptable compromise. In other words, instead of having a fairly large budget in fiscal 1954 and a smaller one in 1955, we would have two medium-size budgets. This might satisfy the demands of economy in the first year.

### Chopping the Size

The other alternative is to maintain the target date for the 143-wing Air Force (end of 1955) but chop the size of the planned force to something in between the 100 wings already attained and the 143 wings planned.

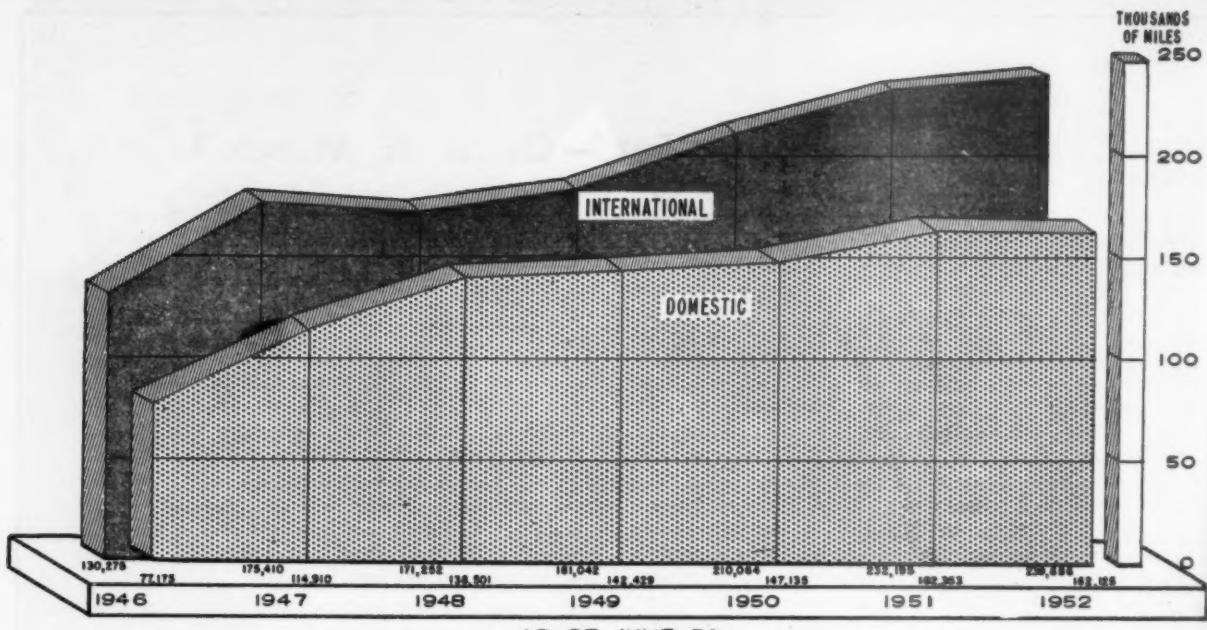
As far as aircraft production is concerned, this would have the same effect as the former possibility—a stretch-out, since there would be fewer airplanes needed in the same period of time. Budget-wise, it would reduce both the current budget, since there would be fewer planes needed in 1955, and the succeeding budget, since there would be fewer sustaining planes needed after 1955.

Proponents of air power are still hopeful that the fiscal 1954 budget will be kept intact, but they are concerned. However, there is one possibility that worries them far more than the current budget, and that is the possibility of a ceiling on expenditures. Expenditures differ from appropriations in that, while an appropriation represents the authority to order a plane, an expenditure is the actual payment for it. Expenditures in fiscal 1954, therefore, will be for planes ordered as long ago as fiscal 1951.

No expenditure ceiling has yet been set, but there appears to be a strong possibility that it might be. Such a ceiling is considered far more serious than a cut in appropriations. It would mean that there would be no money available for some planes already ordered and well along in construction, planes which are to be delivered between July 1 of this year and June 30, 1954.

This would result in pushing deliveries of those planes back into another fiscal year and chopping off production from the tail ends of the orders. This, in turn, would require a complete revision of current programs, since stretched-out deliveries of some planes would be so late as to make them obsolescent before scheduled delivery, a situation which resulted from the last stretch-out.

... JAMES J. HAGGERTY, JR.



AS OF JUNE 30

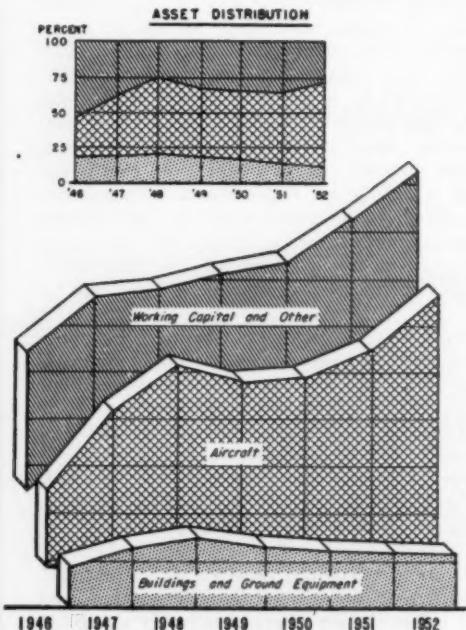
AUTHORIZED ROUTE MILEAGES rose in '52, but slowly.

## Industry Hale and Hearty, CAB Finds

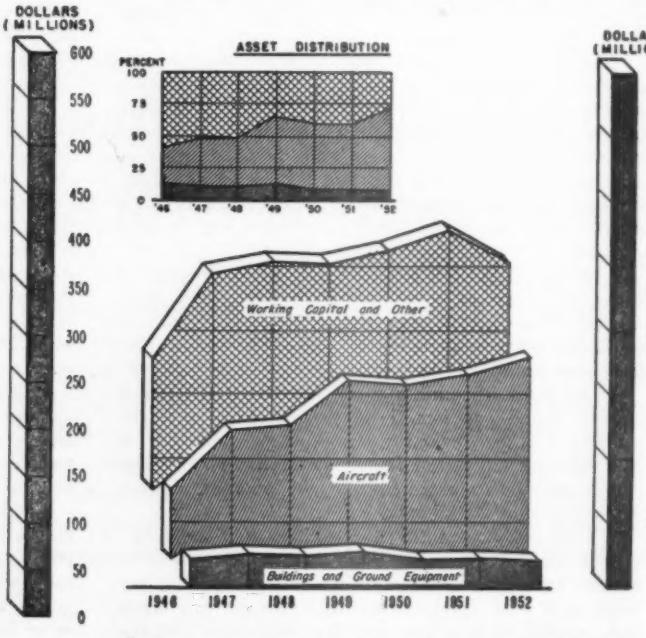
THE CIVIL AERONAUTICS BOARD emphasized a "trend of expansion and general financial improvement" for the airline industry in its annual report to Congress for fiscal year 1952. Highlighted in the report were these points:

• Low-fare air transportation, coach, family plan, etc., continues to grow and contributes substantially to over-all healthy picture of the industry. For example, coach travel accounted for about 15% of total domestic passenger-miles and over 18% of international traffic.

• Mail revenue received by the airlines reflected a "generally improved financial condition." Mail pay for domestic and territorial lines was only seven per cent of total revenues; for international lines, 16% of total. This reflected less dependence on mail-pay sup-

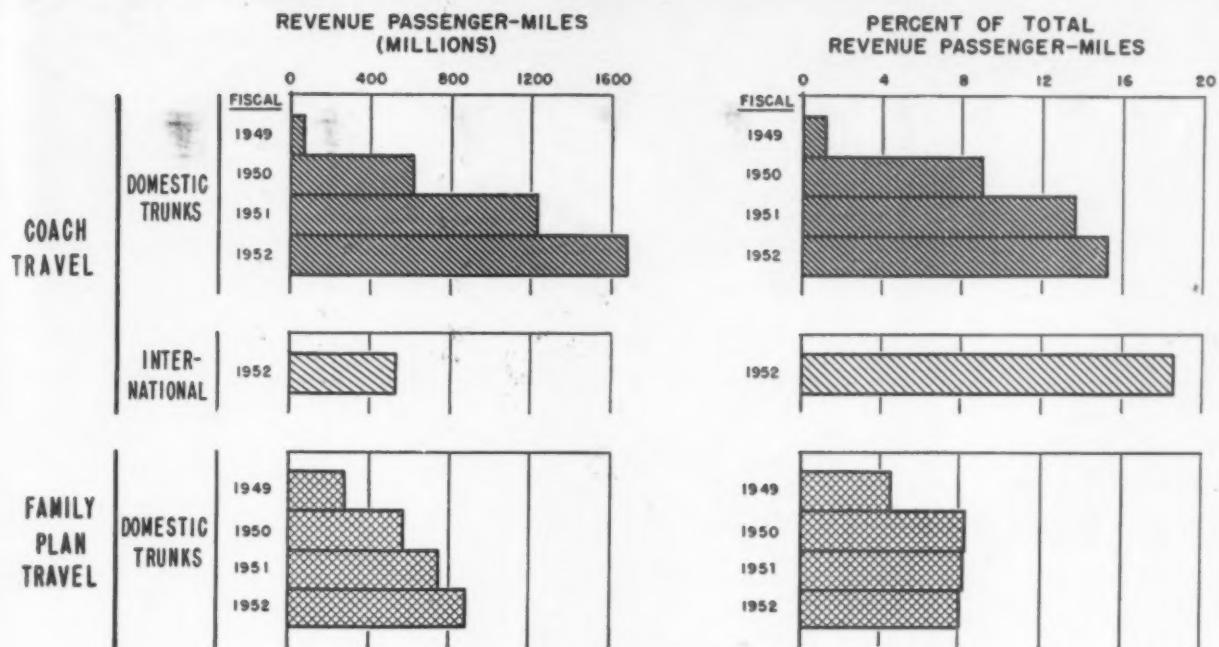


\*Includes international/overseas operations of joint-service carriers



\* Excluding carriers operating joint domestic and international/overseas services

AIRCRAFT INVESTMENT rose sharply for domestic trunks (left, above) while international carriers' working capital slumped (right, above). Both charts are as of June 30.



LOW-COST SERVICES were growing everywhere last year. All charts from CAB.

port than at any time during past five years.

\* Total invested capital of the domestic trunk and local service carrier groups increased, but international and large irregular groups experienced a decrease.

\* Proportion of domestic capital represented by debt became greater during the year for local service and large irregular groups, but decreased for the

domestic trunk and international lines. Debt ratio varied from 16% of total capital for the international group to 39% for the large irregular group.

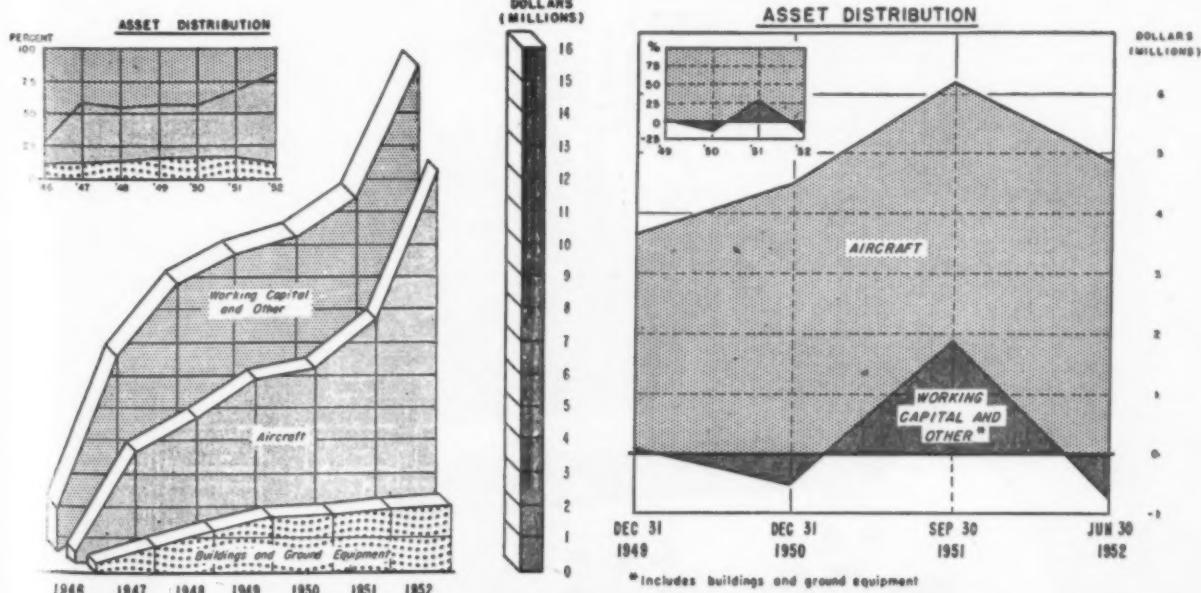
\* Over-all safety record during the past fiscal year continued at a high level, although marked by fatalities in both domestic and international operations.

CAB indicated its own internal situation was continually improving during fiscal 1952, but said its appropriation

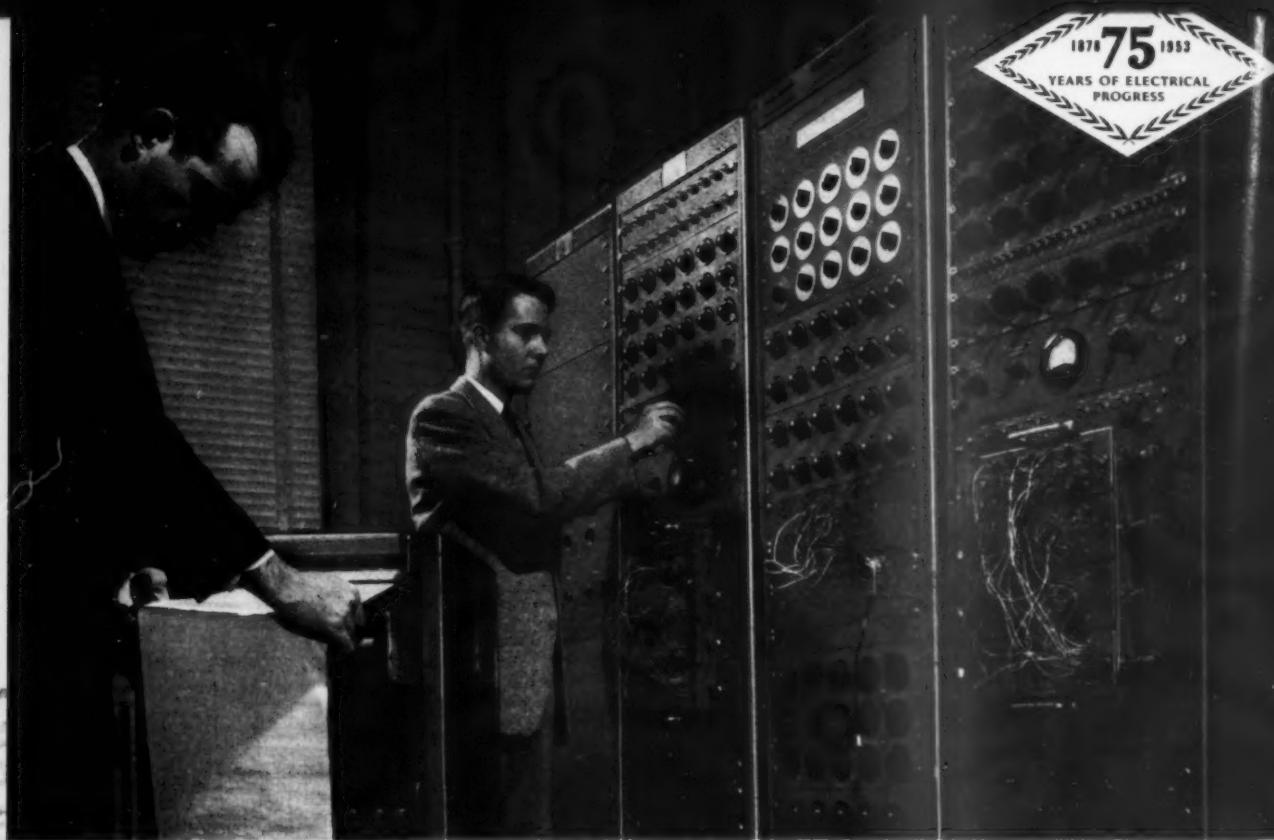
for fiscal 1953 will not support the staff available to it in the previous year. The number of authorized positions has been reduced from 620 to 578 and average employment will drop from 573 to 566.

But it anticipates "meeting this reduction, without material reduction in output, through unfilled vacancies."

Mail ton-miles continued a steady rise, reaching 68.8 million (domestic) and 22.3 million (international). • • •



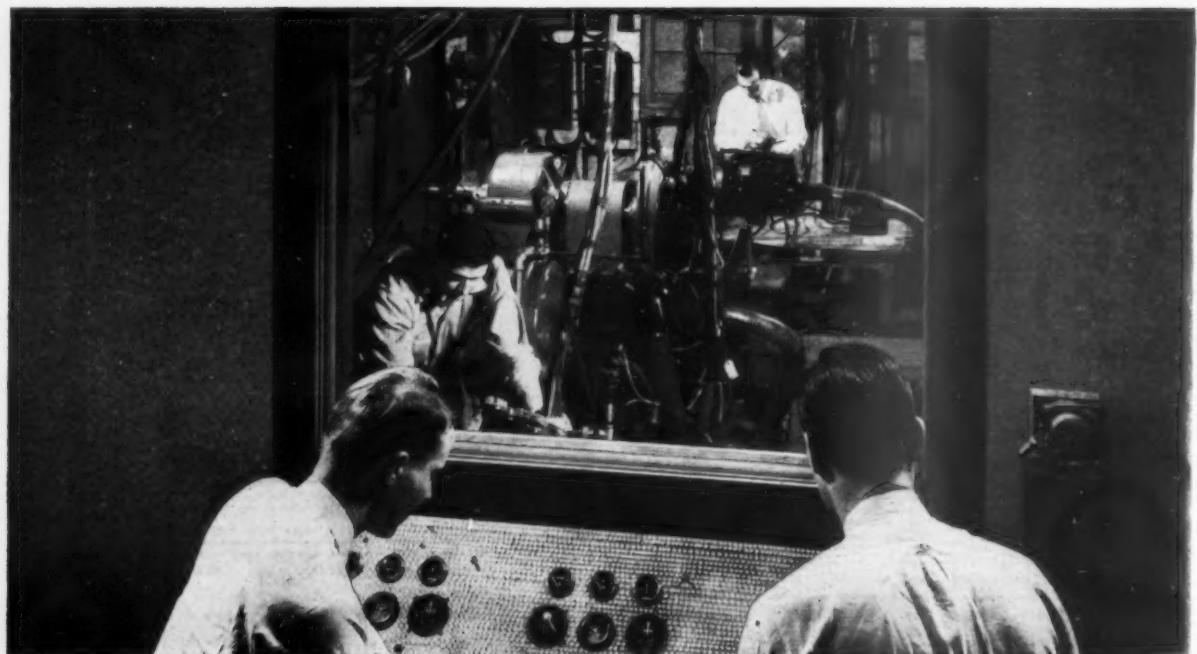
LOCAL SERVICE investment (left) went up like a rocket, but the large irregular carriers (right) saw the period end with their graphs headed down.



**FIRST STEP** for G.E.'s new generator systems is a "test flight" on a Reeves Analogue Computer (above). Circuit designs are set up on a

board, then the Computer checks the designs for accuracy. Before system components are built, G-E engineers can determine best power arrangement.

## How G.E. gives more power to



**NEXT STEP** is a G.E.'s Aircraft Systems Lab, where "bugs" are eliminated from components before mass production. Engineers, above,

are testing new high-performance alternators on special test stand. Centralized control board permits extremely accurate metering.



LOCKHEED P2V "Neptune," long-range Navy patrol craft, will soon carry G-E a-c system and new, specially designed static regulator.



MCDONNELL F3H "Demon" prototype, new U.S. Navy carrier jet, carries G-E a-c generator system.



DOUGLAS F4D "Skyray," now undergoing successful Navy flight tests, gets quick, reliable electric power from G-E a-c generators.

# U.S. aircraft

## "Tailor-made" Generator Systems Now Being Built for Commercial, Military Planes

Two of the most important ideas in the aircraft industry are being carried out today at G.E.'s Schenectady, N. Y., plant. Today's aircraft must have *safe* electric power. But today's aircraft need *tailored* electric power, also.

Recent aircraft power needs have grown so complex that electric "system-thinking" has become rule-of-thumb. That's why G.E. now designs complete a-c and d-c generator systems for its customers. The systems run from standard 28-volt d-c setups to new high-temperature alternators and control for jet aircraft.

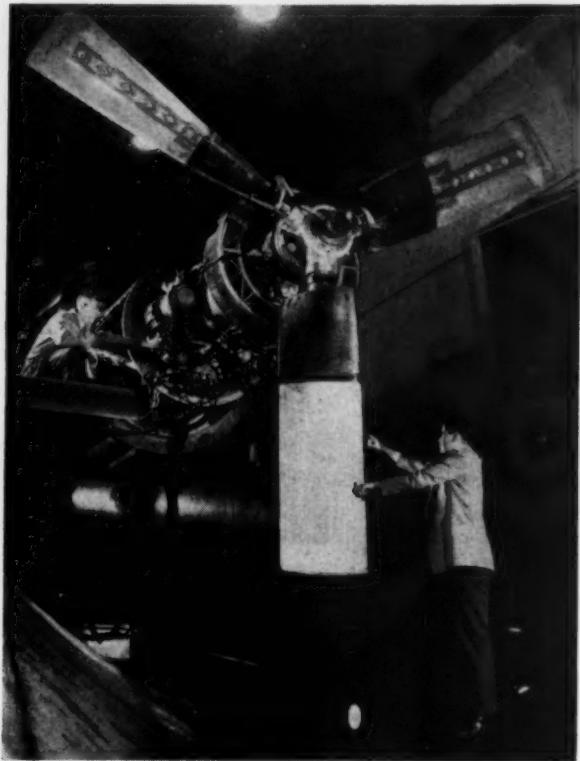
The hunt for higher kva ratings and more power at less weight, goes on continuously at G.E. If you are interested in generator system design and development facilities, why not contact your G.E. Aviation Specialist today? Ask him for G.E.'s new free bulletins on a-c and d-c generator systems. *General Electric Company, Section 10-69, Schenectady 5, N. Y.*



G-E AVIATION SPECIALIST will talk over your needs, help set up your specifications for new G-E system. Call him today.

*You can put your confidence in—*

**GENERAL**  **ELECTRIC**



**U. S. Navy prop.** The latest Hamilton Standard propeller for gas turbine engines, being checked by engineers above, is slated for installation on the Navy's R7V-2 turboprop version of the Lockheed Super Constellation. More propulsive thrust for take-off is claimed for the wide-bladed propeller when mounted on a 5,500 hp Pratt & Whitney Aircraft T-34 turboprop engine.

**Deep freeze** is given to specially treated airplane parts in this 5,000-cubic-foot deep freeze box installed in the Hall of Giants manufacturing center at Lockheed Aircraft Corporation. Metals, such as aluminum alloy, can be "preserved" for easier forming if quick-frozen soon after heating. Photo of stringers being removed from minus 20° box shows the large size of parts that can be stored in 40'x12'x10½' interior.

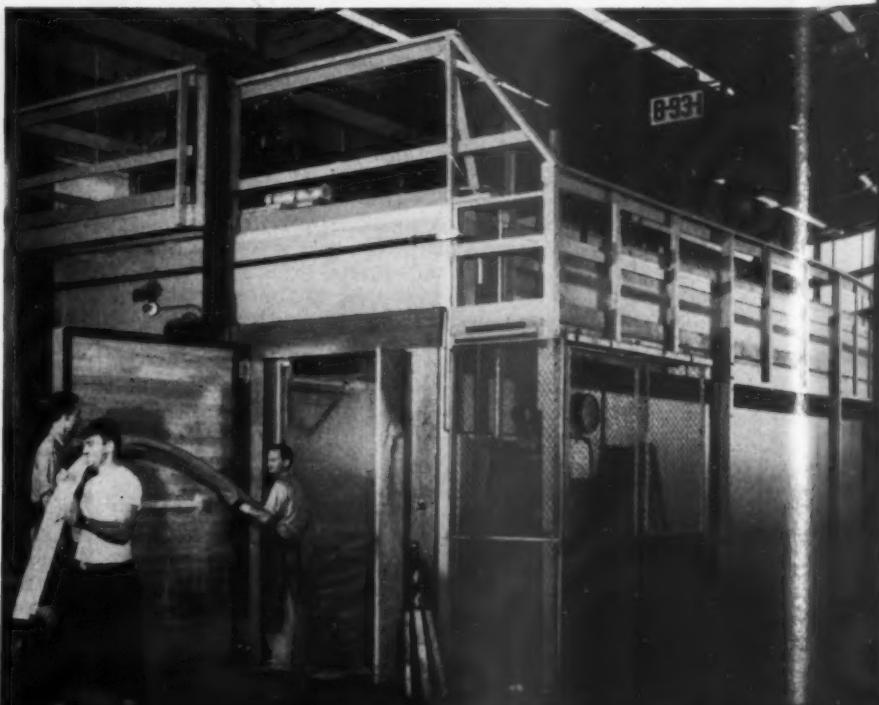


**April target date** has been set for the first flight and CAA certification tests for Douglas DC-7's, shown on production line. In preparation for operating the new transports, Douglas invited five members of the Air Line Pilots Association to a two-day familiarization session at Santa Monica recently.

---

## Production Viewpoint

---



## ACC C-9 Revisions Up Material Allocations

The Air Coordinating Committee's annual report to the President indicates the latest quarterly aircraft production program, C-9, has been revised with the addition of 29 new airliners and 767 non-transport aircraft between January 1, 1953, and June 30, 1955. Revised production for the period now stands at 410 transports and 12,309 other civilian planes.

Since 1951, ACC has recommended allocation of materials for 746 transports, including 115 in 1951, 221 in 1952, 222 in 1953, 180 in 1954, and eight for the first three months of 1955. Of the 746 airliners, 430 are twin-engine and 316 have four power plants. Domestic airlines ordered 574, foreign carriers the remaining 172.

During the same period, ACC has called for the Defense Production Administration to approve 18,006 light-planes and commercial helicopters: 2,500 in 1951, 3,197 in 1952, 4,631 in 1953, 5,198 in 1954, and 2,480 for the first half of 1955.

## Effects of Control Lift

The lifting of wage controls by President Eisenhower means that all aircraft and airline labor contracts which were up for approval before the Wage Stabilization Committee and the Railroad and Airline Wage Board may now be placed in effect. Employers are now free to make the changes sought in their petitions to the two boards. In cases where the contracts provided that they had to be approved by either board, the Presidential order validates them and they have the same standing as if they had been approved.

## Book Review

AVIATION ALBUM, by Edward L. Throm and James S. Crenshaw. Popular Mechanics Press, 200 E. Ontario St., Chicago 11, Illinois. 192 pages. \$3.00

A fast trip through the last 50 air-  
ne years. Smoothly and colorfully  
told, although necessarily rather  
compressed at points. The length of the text  
restricted not only by the small num-  
ber of pages but also by the 264 illustra-  
tions, which suffer from the method of  
production. Perhaps the most interest-  
ing of these is a photo of a Super Con-  
stellation, which is identified as a turbo-  
jet fighter. Modesty is all very well,  
Lockheed should not go on hiding its  
light under a bushel if there are plans  
for using the ubiquitous Connie in  
its role.

... WK



## West Coast Talk

By Fred S. Hunter

FINAL ASSEMBLY of F3D's ends at Douglas El Segundo this month. Last delivery to the Navy is scheduled in August. The "bone yard" of F3D's waiting for engines is diminishing rapidly. A while back, Douglas had 180 planes waiting for engines. Now it has only about a score. The F3D, now being used as a night fighter by the Marines in Korea, is powered by two Westinghouse J34 engines and is equipped with Westinghouse AN/ALP-35 radar and fire control with tail warning.

### LOCKHEED ORDERS PILING UP

Lockheed has picked up \$71,000,000 in follow-on orders on four types of military planes. They include: (1) a small number of P2V Neptunes for MDAP; (2) a moderate order for the Navy's TV-2 version of the T-33 jet trainers; (3) additional quantities of WV-2 and RC-121 Super Constellation type radar planes for the Navy and the Air Force. The new military Constellation orders will mean an extension of almost a year in Lockheed's production line for the early warning patrol plane version, carrying delivery schedules into 1955.

### MAINTENANCE HAS THE SHORTS

It seems strange to note layoffs at a time when business in the industry mostly is booming. It would, of course, happen in the overhaul business, where it is always feast or famine. The trouble is the Air Force is fresh out of money. What may be left in maintenance funds is being used to keep the depots going.

A while back Grand Central Aircraft Co.'s Glendale base was loaded. It was overhauling more than 100 Air Force C-47's and its engine shop was full of work orders for the overhaul of several hundred R-1830's. It had a high of 1,400 workers on the job. There are 400 now. The C-47's were finished up a month or so ago. The last of the engines came out of the shop the other day. Commercial work is all that is left at the long-established Glendale facility.

Same thing at Pacific Airmotive Corp.'s Burbank base, where commercial business is excellent, but layoffs are taking place between military contracts. Rehabilitation of F-51's has come to an end and an R-2800 engine overhaul contract is dwindling to a close.

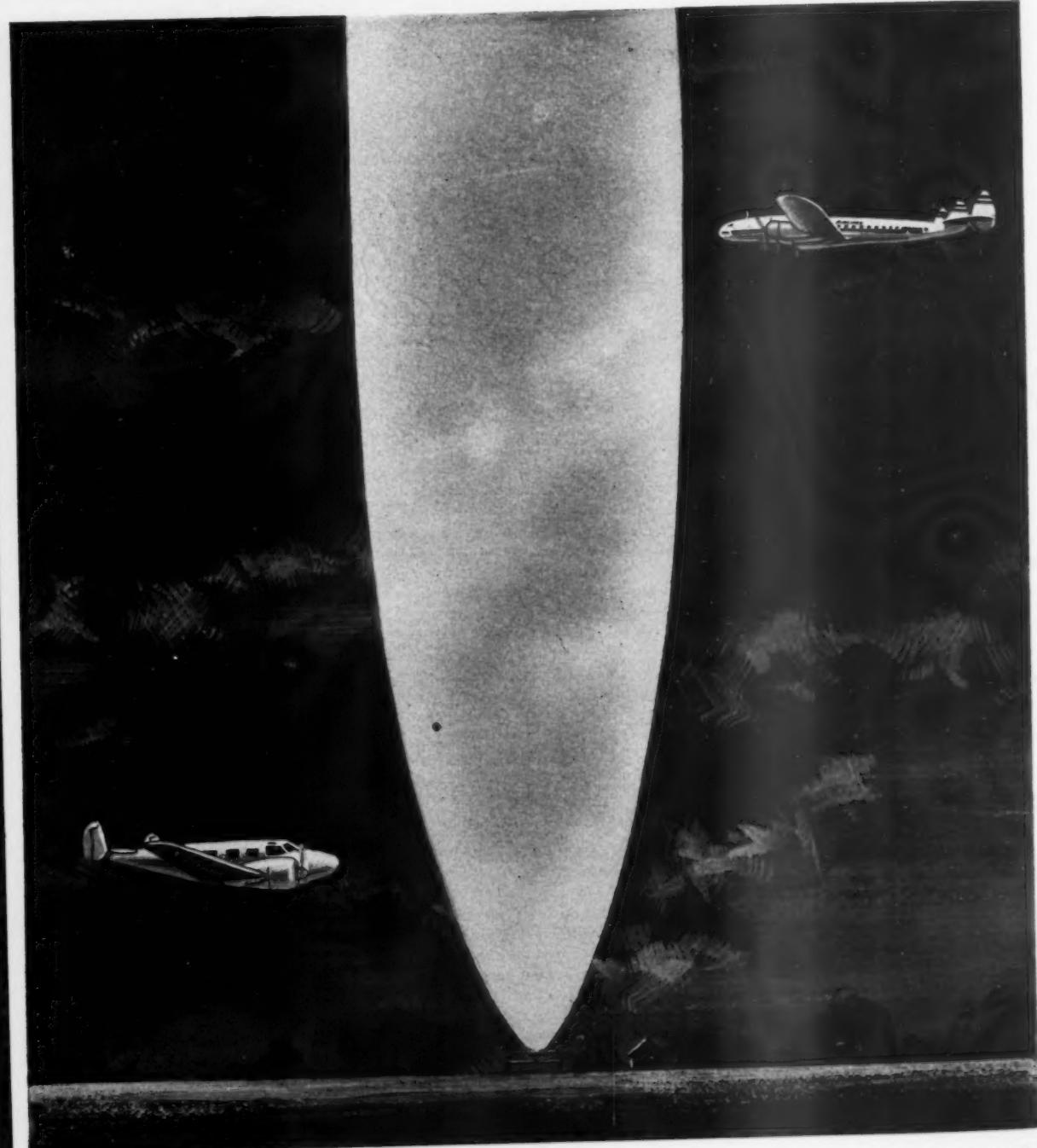
PAC is performing heavy maintenance on MATS C-54's at its Chino base, but the current contract is about half that of the former contract. PAC shares this C-54 work with Aircraft Engineering & Maintenance Co. in Oakland and Temco Aircraft Corp. in Dallas, whose contracts also were reduced proportionately when renewed last year.

The overhaul companies are now marking time until fiscal 1954 maintenance funds become available, at which time they hope new aircraft and engine maintenance and overhaul contracts will be awarded. Meanwhile, overhead goes on.

### WEST COAST MISCELLANY

AiResearch Manufacturing Co.'s new warehouse for raw and finished stores picks up heavy bar stock with an overhead crane mounted on rubber wheels for quieter operation. . . . North American Aviation is about to turn back to the Air Force the Boeing C-97 it has had on bailment for about two years to use in its guided missile work. . . . Remember the news story back in 1949 of the passengers who seized control of a Communist DC-3 in the air after it had taken off from Budapest and made their escape from Hungary by flying it to Munich in the American zone in Germany? Leader of the group, who took over the cockpit, John Majoros, is now a design engineer at Convair in San Diego. . . . Capt. Eddie Rickenbacker, president of Eastern Air Lines, went up to Seattle to talk to Boeing about its jet transport design when he was on the coast recently to attend a Douglas symposium on the DC-8. He also spent some time talking to Lockheed about its plans. William Littlewood, vice president-engineering, also took a run up to Seattle to see Boeing. He stopped at Lockheed, too.

# "WHY IS THIS THE STANDARD ON



AMERICAN AVIATION

# MARKER RECEIVER ALL U.S. AIRLINES?"

**WHY HAVE THE GREAT AIRLINES HERE AND  
ABROAD PUT MORE THAN 2,000 OF THESE  
BENDIX NAVIGATION AIDS IN SERVICE?**

These Bendix Receivers are accurate. They're simple. They're trouble free. That's the whole story why the flying world depends on them.

And ever so often we like to tell people why these Receivers are so dependable.

#### **No relays used**

Your Bendix Receivers have no relays. Thus there are no contact points to burn or wear out. There are no springs to vary in tension. No coil windings to open.

#### **Audio signal operates lights**

The pilot's indicator, in Bendix Receivers, operates directly from the incoming audio signal.

From then on, it's visual. The pilot sees the marker signals in the three colored lamps on his indicator.

White for the airway markers . . . amber for the inner . . . purple for the outer.

#### **High and low sensitivity**

There's a switch on the pilot's indicator that permits high or low sensitivity settings.

Flying low, the "low" setting pinpoints the marker beacon location. Stray radiations cannot cause premature indications.

Flying high, the "high" sensitivity setting insures sufficient duration of the light signal to identify the marker.

#### **Fits any aircraft characteristic**

The antenna can be anywhere in the ship. The length of cables is not critical. It will operate from either 14 or 28 volt primary power sources.

#### **Available in two sizes**

The MN 53B Marker Receiver is designed for Executive type aircraft. It weighs 11½ pounds.

The MN 61B is built to standard ATR specifications. It weighs 13 pounds.

That's the story. Good engineers made it possible.



**Bendix**

THE MOST TRUSTED NAME IN

**Radio**

**BENDIX\* RADIO**  
BALTIMORE 4, MARYLAND  
A DIVISION OF BENDIX AVIATION CORPORATION



\*REG. U. S. PAT. OFF.

**THE COMPARATIVE CITY CENTER TO CITY CENTER SPEED OF THE HELICOPTER, AIRPLANE & RAILROAD.**

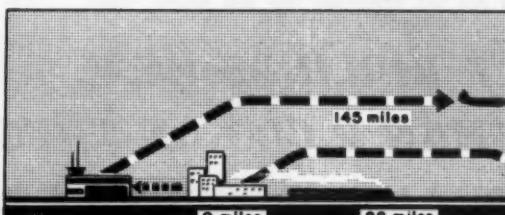
(Helicopter cruising 150 mph, airplane cruising at 300 mph, and train cruising at 65 mph).

**CITIES 100 MILES APART**  
(Approx. .90 hrs.)



I - Arriving at a city 100 miles away, the helicopter has far outstripped the train while the airplane is only 15 miles on its way.

**CITIES 200 MILES APART**  
(Approx. 1.60 hrs.)



II - When the helicopter reaches a city 200 miles away, the airplane still has 55 miles to get to the airport apart from the time which it will take the airplane passenger to get downtown.

## No Doubt About 'Copters, But When?

**Industry waiting for manufacturers to turn out a model that will compete with DC-3 costs, survey shows.**

By WALTER A. KILRAIN

THAT the helicopter has a future in air transportation no airline executive in sight will question, but if industry leaders are confident about that much they are the soul of caution when it comes to naming a starting date for the Age of the Helicopter.

When that time arrives apparently depends on the manufacturers. If any manufacturer can produce a helicopter with the following characteristics it seems likely, from a survey recently run by AMERICAN AVIATION, that air carriers large, small, and in between will respond with orders for it, and the rotary-wing transports will be up and away.

Here's what the carriers say they want:

- Cruising speed of 100-200 mph;
- Range of 200-300 miles;
- Passenger capacity of at least 30;
- Twin engines, and perhaps twin rotors;
- Ability to cruise to the nearest helicopter on one engine and one rotor;
- Operating cost per seat-mile approximating that of the DC-3.

Of all the requirements, the last is perhaps the most important. Throughout the responses to the survey runs the refrain: "We'll fly helicopters as soon as we can afford to fly helicopters."

Where the helicopters will fly is the subject of a fair variety of specula-

tion. Most carriers agree that the 'copters will inevitably take over the function of the airport limousine as well as serve between trunkline cities that are up to 75-100 miles apart. Pioneer Air Lines foresees a particular use in gathering passengers from smaller cities scattered up to 100 miles around metropolitan areas in Texas and depositing those passengers where they can catch a fast plane out.

There are some skeptics, of course, even on subjects where opinion is most united, such as the airport-limousine role for the helicopter. The prospect left Braniff's executive vice president Charles E. Beard with some disturbing memories. Writes Beard:

"I am inclined to go back in my experience to the early days in Chicago when we tried to establish a faster means between downtown and the Chicago airport. An amphibious service was provided from the Chicago lake front to the airport. The lake front base was only a two- to five-minute taxicab ride from any place in the general area of the Loop. There was some time saving in the service, probably ten to fifteen minutes. On the other hand, there was the inconvenience of loading your baggage into a cab, getting into it, getting out and unloading your baggage from

the cab at the amphibian dock, loading the baggage into the amphibian, and getting into it yourself, going through the process again in deplaning at the airport, and then checking in on the airline. It was simply too inconvenient and the public did not take to it . . ."

Beard's conclusion: "Helicopter taxi service is a long way off."

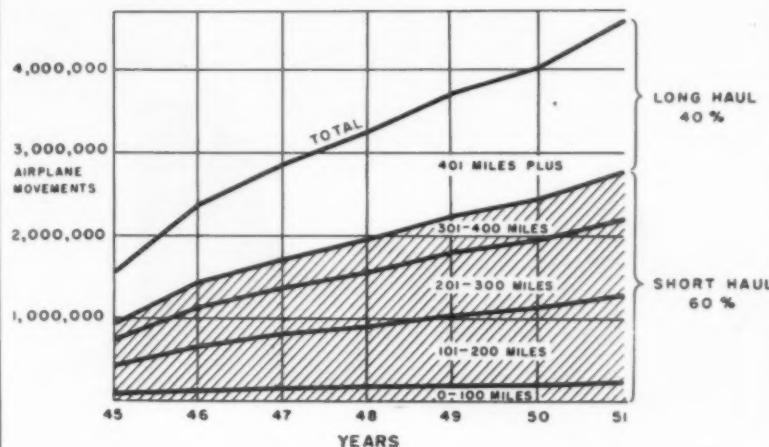
Taxiing freight to the airport, however, presents a different and brighter picture. The Flying Tiger Line now has to stop picking up freight from its customers in Los Angeles, San Francisco, Chicago, and New York at 4 p.m., since rush-hour traffic makes the truck trip to the airport in those cities a slower operation than is worthwhile. With helicopters to carry the freight to the airport, the Flying Tigers estimate that they could continue pick-ups until 6 p.m. and speed up operations 100% or more.

For such an operation the Tigers want a helicopter that will lift at least 7,000 pounds, and if possible 10,000 pounds. "If the cost and ability to lift were right we would use helicopters at certain points immediately," reports Vice President George T. Cussen.

Another suggestion for a possible use of the helicopter, although a rather specialized one, came from Braniff's Beard, who, though skeptical about the use of the craft as taxis between the city and airport, thought they could well be used between New York's widely separated airports in a shuttle service. Considering the limited number of pas-

**TOTAL CIVIL CARRIER MOVEMENTS PER ANNUM AT  
CAA CONTROLLED AIRPORTS AND NUMBER OF  
MOVEMENTS DUE TO SHORT HAUL FLIGHTS**

N.B. BREAKDOWN OF STAGE LENGTHS ESTIMATED BEFORE 1949



**SHORT HAUL** business makes up 60% of carrier movements giving the helicopter a broad field to cultivate.

sengers on any one plane who might want to transfer from LaGuardia or Idlewild to Newark, Beard feels that the service would have to be a "gathering operation, taking passengers from a number of airlines and a number of arrivals in order to get a load that would pay the cost."

Capital's Hayes Dever estimates that a direct cost per seat-mile of about two cents would satisfy Capital, since at this rate a fairly low speed would be acceptable to the public. As the cost rises, Dever points out, the public will demand faster service. If the cost should go as high as 10¢ per mile, which is what he estimates current airline fares average with taxi and limousine fares added in, the public would demand

fixed-wing speeds in return for its money. A helicopter with a 125-mph speed would keep ahead of the fixed-wing plane, Dever calculates, on flights up to 300 miles (for Piasecki's calculation, see chart on page 42).

Dominant theme in almost all the replies was the confidence the carriers share in their ability to put the helicopter (the right helicopter) to good use. Northeast Airlines president George Gardner would put it to work from Presque Isle to Boston "almost immediately." R. W. Clifford, vice president-operations for Lake Central Airlines, summed it up: "We feel that any transportation media that offers a service to 85%-90% of the traveling public has a definite future." • • •

#### NEWS BRIEFS

A correction has been made in the speed record set last November 19 by a North American F-86D. Original mark: 699.92 mph; revised calculation: 698.5 mph. The latter figure has been approved by the Federation Aeronautique Internationale.

• •

Philadelphia, the City of Brotherly Love, seems to have been afflicted with considerable hostility, which has settled around its airport officials. J. Victor Dallin has been suspended for 30 days as chief of the Bureau of Aeronautics

by Director of Commerce Walter M. Phillips, who charged him with "failure to formulate policy intelligently and clearly." Dallin may be replaced by Louis R. Inwood, director of aviation at Kansas City, Mo., and incumbent president of the Airport Operators Council.

• •

April will see the first Finnish Air Lines Convair 340 flying the Helsinki-Paris route if all goes well, according to Aero O/Y chief pilot Capt. Olli Pubrakka.

#### Airport Use Panel

#### Changes Attitude

The future efforts of the Air Coordinating Committee's Airport Use Panel will be directed toward preventive measures aimed at averting bothersome conflicts between the interests of military and civil users of the nation's airports rather than continuing the past practice of acting as a "fire department" and trying to put out "fires" that have already started.

In its annual report to the President the ACC said the trend toward stabilization of the military aviation programs makes such an objective possible. Summarizing the activities of some of its other units during 1952, ACC told of these developments:

- Experience indicates that full-scale implementation of the all-weather system of air traffic control is not required at all locations. CAA estimates that approximately 83 locations will need to be provided with radar.

- The NAV Panel is completing a study and report in regard to the problem of terrain avoidance in aircraft operations and is developing operations requirements for helicopter navigation.

- The Airspace Subcommittee made recommendations on more than 2,000 separate airspace problems last year, including 190 applications for erection of television towers that might constitute hazards to air navigation. Also mentioned were the following long-range studies of ACC's Technical Division: The development of a comprehensive U. S. aeronautical fixed and mobile tele-communications policy, the development of an integrated national system for the distribution of notices to airmen (NOTAMS), reallocations of frequencies for the Aeronautical Radio-Navigation Service, and evaluation of U. S. policy relating to charges for air navigation facilities and services in the international field.

#### TECO Backlog Reaches Record \$2 Million

A backlog in excess of \$2 million, largest in company history, is reported by the Transport Equipment Company, Burbank, Calif., for TECO airline seats and berths. Outstanding orders include those of Trans World, Eastern, Trans-Canada, and Trans-Texas airlines, with recent foreign orders coming from British Overseas Airways Corporation and Qantas Empire Airways, both for Lockheed Constellation aircraft.

The company is also reported developing a high "G" load aft-facing seat for a new jet transport still under wraps.



## Flying staff car

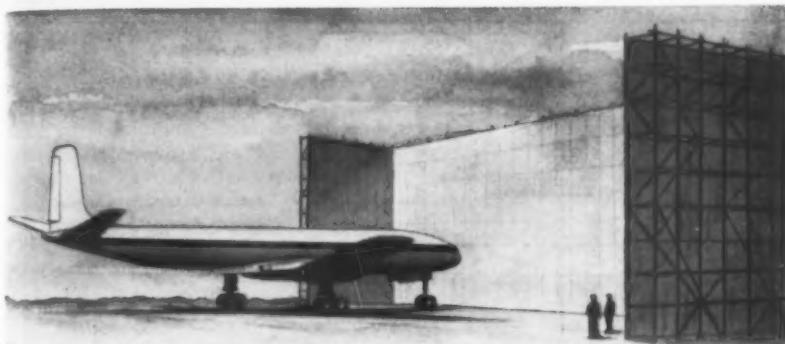
This rugged twin-engine Beechcraft operated by the Army Ground Forces carries six, has a top speed of over 200 mph and a range of 1155 miles. It delivers the versatile, exceptionally dependable performance characteristic of Beech planes.

With Army designation L-23A, it is a modification of the brilliantly engineered Beech Twin-Bonanza. The L-23A is one of many Beech military planes now in production.  
Beech Aircraft Corp., Wichita, Kansas, U.S.A.

B  
Beechcraft

HELPING AMERICA BUILD FASTER

AMERICAN AVIATION



JET TRANSPORT NOISE data was secured from BOAC Comet I and run-up pen, artist's sketch of which is shown. Airplane was parked with engines about 40 feet from wall.

## Wall Helps Solve Jet Noise Problem

Run-up pen tests by British may point way to solution for biggest jet operational headache.

By JOSEPH S. MURPHY

THE BIGGEST single operational problem facing airport authorities and the airlines with the start of scheduled jet transport operation is that of noise, both the noise of low-flying jets during landing and take-off and that of ground operations when engines are run for extended periods by airline maintenance crews.

The problem is not altogether a new one restricted to jets, but presumably the noisier jets will magnify any situation that exists now and will produce others in areas not yet considered critical.

One critical area is New York City. Over the past three years the growing objections of residents near airports in the New York area have brought about special operating procedures at all three of the major airports in the area. Take-offs and approaches are restricted by a preferential runway system so that planes will avoid densely populated locations; altitudes up to 1,000 feet are held by approaching airplanes as long as the performance of the airplane will permit before the final approach to the airport is begun; and only areas selected by airport officials can be used for engine ground testing operations.

The newer jet problem has not gone unrecognized. In one recent appraisal of

the noise dilemma, by Aircraft Industries Association president Admiral DeWitt C. Ramsey, the progress of jet transport development itself was declared to be at stake. The best measure of the recognition of the problem can be found in the activity of the groups that are studying it, prominent among which are:

• The National Advisory Committee for Aeronautics: A subcommittee is investigating the sources of jet noise.

• The Research and Development Board: A panel is studying not only

noise from aircraft but that from all other types of military vehicles.

• The U. S. Air Force: Concentration here is on muffling engine test cells and jet aircraft on the ground.

• The Doolittle Commission: Its recommendations that flight patterns be arranged to reduce ground noise and that airplane run-up areas and test stands be given acoustical treatment are being studied by the Commerce Department.

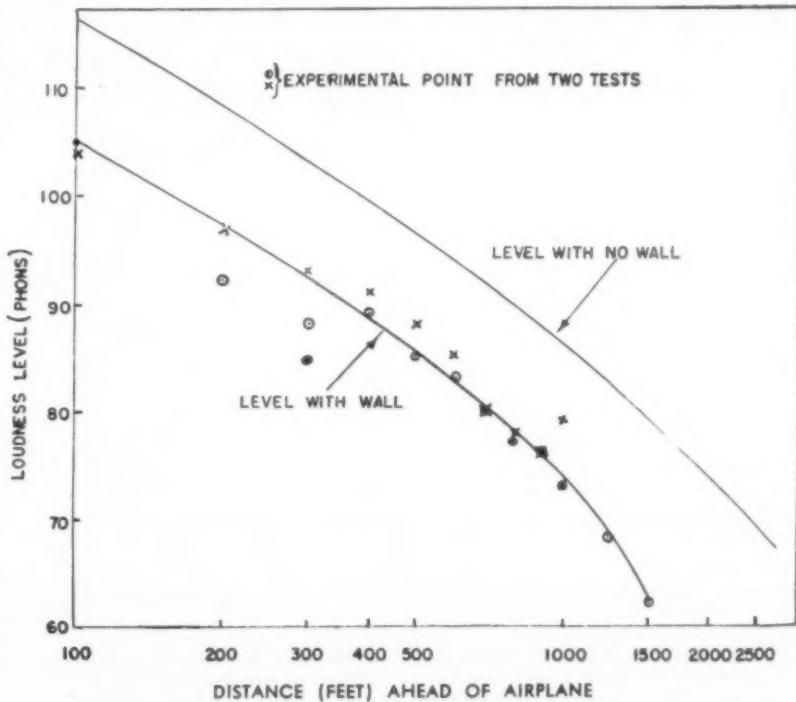
• The National Air Transport Coordinating Committee: Its activities have been confined to the New York area, where the problem has been most critical.

• The Air Line Pilots Association: ALPA has taken sound measurements at all critical locations throughout the U. S.

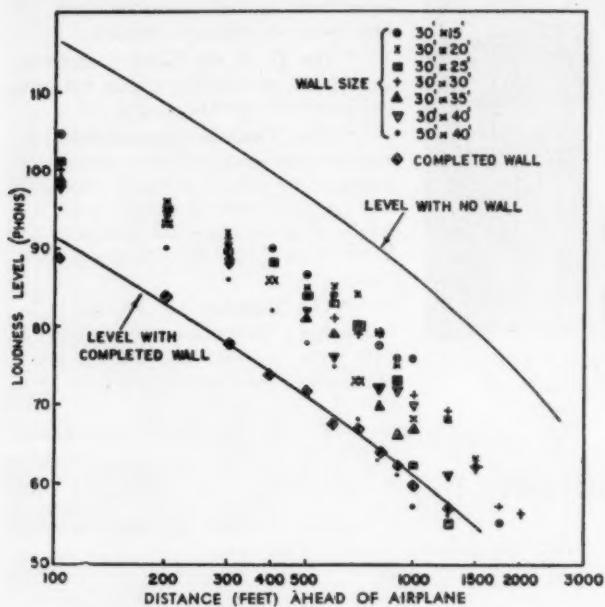
• The Aircraft Industries Association: Its noise control committee has set up a standard for noise measurement now in wide usage.

In the phase of the noise problem relating to ground operation of engines, an extensive test program started in 1951 by the British Ministry of Civil Aviation and now being carried into the operational phase is producing some real results using acoustic screening for an engine run-up pen at London Airport.

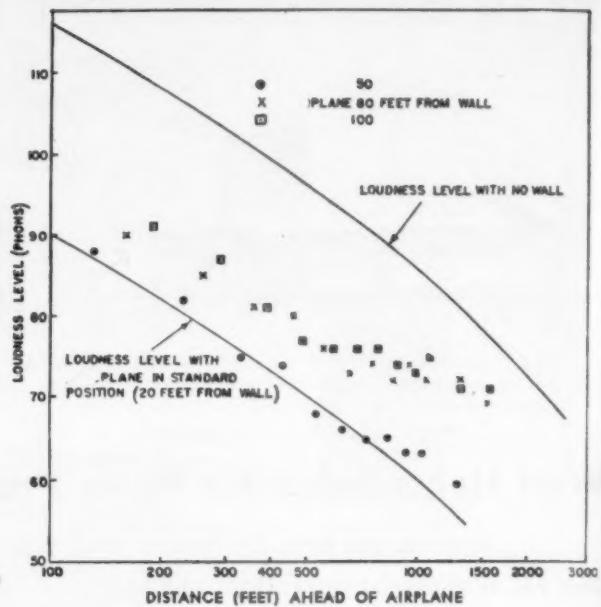
With the prototype of a new wall now under construction to study the operating problems that such a device will introduce, J. D. Hayhurst, who is directing the research for the Ministry of Civil Aviation, recently reviewed the



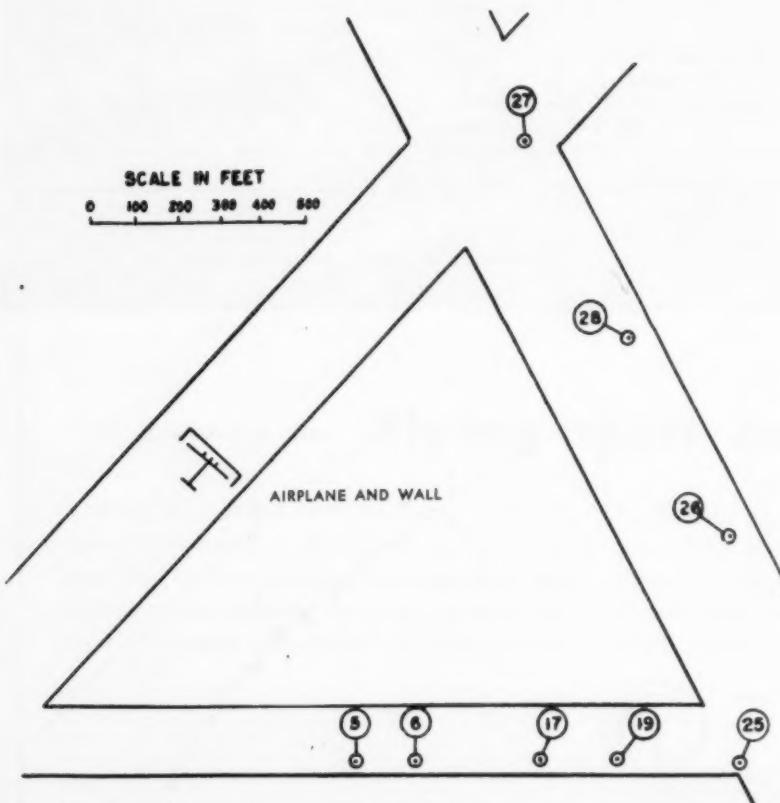
FIRST TEST RUN by Ministry of Civil Aviation with Viking located 20 feet back from acoustic wall (30 feet wide and 15 feet high) showed the noise level to be cut in half, with the effect of the wall carrying for the full 1,500-foot distance at which readings were taken.



NOISE LEVELS calculated over the test period ranging from the "no-wall" condition to that of the completed wall 50 feet wide and 40 feet high, with a Viking airplane set 20 feet back from the wall.



MOVING THE VIKING away from the completed wall brought reduction of 20 phons in noise level found with airplane 100 feet back of wall, as contrasted with standard location 20 feet back, when measured at a point 1,500 feet ahead.



SHADOW EFFECT of run-up pen is shown in reduced loudness level (phons) shown in circles obtained at eight points ranging from directly ahead of wall to a point where the least wall effect could be expected.

results obtained with an original experimental model, with which the tests were confined to the acoustic qualities of the pen. Hayhurst pointed out these significant findings:

- A reduction of noise to 1/8 of its original loudness can be obtained for distances up to one mile, and possibly more—a measure far beyond expectations when the test was started.

- The reduction far exceeds any that could be realized by the use of such existing facilities as trees and buildings, these latter producing an effect that is barely noticeable and insufficient to warrant any special effort.

Preparations for the test were all-inclusive, with these considerations given to the details of the site of the experiment, the equipment to be used, and the methods by which the test data would be recorded:

*Variations in Terrain*—One of London Airport's non-operational runways about 3,000 feet long was selected for the pen installation. Here the absence of buildings eliminated sound reflections that would have hampered the tests.

*Weather Variables*—With the correction factors for temperature and humidity already known, a special study provided empirical corrections for the effect of wind over the range of distances to be covered in the investigation.

*A Standard of Measurement*—Use of a sound level expressed in phons permitted the relationship between any two noises to be better appreciated.

Initial sound pressure levels recorded in decibels for each of the eight octaves were translated into a single level in phons. To the average observer, a difference of about nine phons in the loudness level of two noises will sound as though one is half as loud as the other.

*A Source of Noise*—A Viking airplane fitted with two Bristol Hercules model 630, 14-cylinder engines and a pair of four-bladed de Havilland 13½ foot diameter propellers was used for most of the test work. Later in the program, a British Overseas Airways Corporation Comet I provided the noise source for jet engine data.

Preliminary tests with the Viking proved that the noise from one engine operating at 1900 rpm and at a manifold pressure of 29.5" Hg would give a satisfactory level of sound and avoid the possibility of exceeding temperature limitations or overriding the brakes if still higher powers were to be used on one or both engines. These tests also established that the noise of two engines would have produced a sound output only three decibels greater than that of one engine.

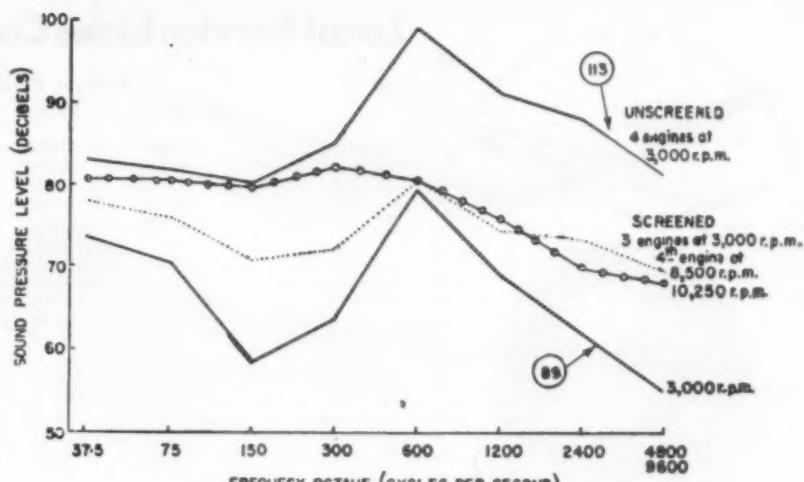
*Instrumentation*—Sound measurements were taken with an Objective Noise Meter manufactured by Standard Telephones and Cables, Ltd., which included a microphone mounted about four feet above the ground for the recordings, a calibrated attenuator, an amplifier of known gain, and an output meter. Electrical filters permitted measurement of sound pressure levels in decibels in each of the eight octaves from 37.5-75 cycles per second to 4,800-9,600 c.p.s., from which the readings were translated into a single loudness level.

*The Acoustic Wall*—Erected in stages from a starting dimension of 30 feet wide and 15 feet high, the wall was constructed of ¼" thick corrugated asbestos cement sheeting, weighing 2½ pounds per square foot and overlapped on installation four inches horizontally and six inches vertically. Support was provided by a tubular steel scaffolding.

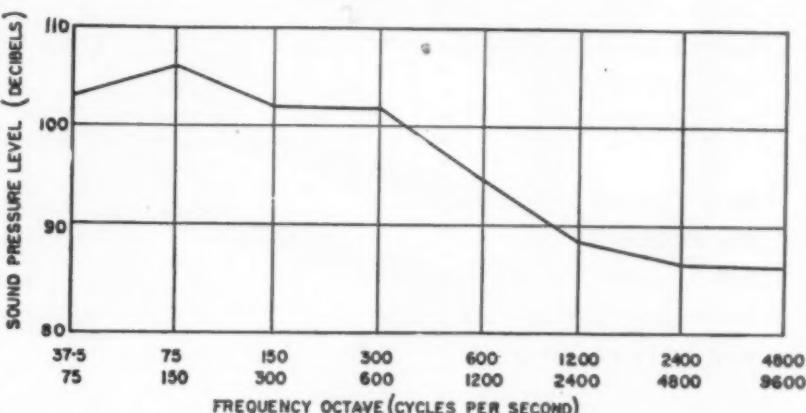
Measurements taken at the completion of each stage of wall construction provided data for a new size of run-up pen for comparison with the no-wall condition and with the results gained from the smaller size pens previously tested.

The 30 foot width was maintained while varying the height from the original 15 feet at five foot increments until a height of 40 feet was reached, after which the pen was widened to the 50 foot dimension.

In the initial tests with the 30 foot by 15 foot wall the results brought early encouragement that further work with the pen would be justified. Tak-



BOAC COMET I produced favorable results. Data shown were obtained 100 feet forward of wall; figures in circles are loudness levels (phons) indicating a reduction of 24 phons using the pen, a noise about  $\frac{1}{8}$  as loud as was experienced with no wall.



VICKERS VIKING SPECTRUM with right engine running measured at a point 100 feet ahead of the airplane. Converted to loudness levels, these values were used as a datum to which the recordings obtained with the acoustic wall were compared.

ing readings at positions from 100 feet forward of the wall up to 1,500 feet, the noise reduction was almost as constant 10 phons (see chart, p. 45) with no loss of the screening effect as the distance was increased.

With each increase in wall height there was a general increase in the screening effect obtained, with still no indication of the effect falling off with distance away from the wall. At each step in the growth of the wall, the Viking was moved back 100 feet from its normal position to simulate the condition of the large airplane placed with its tail to the wall. In all instances the screening effects were less than with the airplane in its normal position.

To conclude the test program data was recorded on a BOAC Comet I with the engines situated about 40 feet back from the wall and with readings

taken at one point 100 feet forward. Here the screening effect was no less than that obtained with the Viking.

Carrying the noise research to the effects of trees, the group simulated the run-up pen conditions with a Viking at an outlying airport. But no results comparable to that of the pen could be obtained, with a "hardly noticeable" reduction of five phons brought about by a 100 foot belt of trees.

With the results at hand from the initial British experiments, the outlook for the run-up pen in airport noise abatement has been brightened, and only its ability to prove itself operationally remains to be shown.

The encouraging results of the acoustic tests almost dictate that the run-up pen be given a full trial, and the British Ministry of Civil Aviation apparently plans to do just that. \*\*\*



**PAL**

ROUTE OF THE Orient Star

from  
SAN FRANCISCO  
to LONDON via  
the ORIENT

**Best liked  
by those  
who know  
international  
air travel best**

- superlative service
- top-flight meals
- reliable schedules
- DC-6B and DC-6  
comfort and dependability

for the  
**FLIGHT TIME**  
of your life

FLY



PHILIPPINE AIR LINES

DEPENDABILITY spanning 3/4 of the world

San Francisco • New York  
Chicago • Washington, D.C.  
Los Angeles • Honolulu

## Local Service Lines Carry 18% More in '52

	Revenue Passengers			Rev. Passenger-Miles (000)		
	1952	1951	% Change	1952	1951	% Change
Allegheny .....	183,986	213,896	-14%	26,798	30,689	-12.7
Bonanza .....	43,705	30,216	44.6	10,751	7,716	39.3
Braniff (1) .....	50,039	42,058	18.9	9,514	8,710	9.2
Central .....	47,167	35,303	33.6	6,689	5,263	27.0
Frontier .....	127,398	104,792	21.5	34,025	28,015	21.4
Lake Central ...	33,213	31,564	5.2	5,481	6,176	-11.3
Mid-West (2) ...	866	2,693		128	406	
Mohawk .....	110,514	103,696	6.5	19,220	16,276	18.0
North Central ..	153,077	96,302	58.9	25,238	15,309	64.8
Ozark .....	84,463	49,507	70.6	14,147	8,130	74.0
Piedmont .....	244,702	189,831	28.9	50,435	44,380	13.6
Pioneer .....	183,271	164,171	11.6	48,886	43,891	11.3
Southern .....	121,375	96,818	25.3	20,820	17,439	19.3
Southwest .....	165,057	137,821	19.7	31,331	27,383	14.4
Trans-Texas .....	78,214	77,799	0.6	18,361	18,455	-0.6
West Coast (3) ..	143,554	123,534	16.2	24,296	21,393	13.5
Wiggins .....	3,178	4,094	-22.4	313	382	-18.1
<b>TOTALS .....</b>	<b>1,773,779</b>	<b>1,504,095</b>	<b>17.9</b>	<b>346,433</b>	<b>300,013</b>	<b>15.4</b>

(1) Braniff and Mid-Continent merged Aug. 16, 1952 under the name of Braniff Airways. The 1952 figures include operation to Aug. 16 by MCA and thereafter by the combined company. The MCA 1951 total is listed under Braniff. Figures cover only local service route 106.

(2) Mid-West ceased operations May 15, 1952, following non-renewal of its certificate by CAB.

(3) West Coast and Empire merged Aug. 4, 1952, West Coast being the surviving company. The 1952 figures include operations of the separate companies before the merger, and the combined company thereafter. The 1951 totals of both companies are under West Coast.

Local service airlines showed a 17.9% increase in passengers carried in 1952 as compared with 1951, and a 15.4% gain in passenger-miles.

All but two of the carriers increased their passenger business. Ozark Air Lines showed big gains (70.6% in passengers and 74% in passenger-miles) in 1952 over 1951, which was its first full year of operations, after opening service in September 26, 1950. Large increases were also shown by North Cen-

tral (formerly Wisconsin Central), which was awarded several route extensions in 1952. Its passenger total was up 58.9% and passenger-miles 64.8%.

Two carriers showing decreases were Allegheny (formerly All-American), which dropped 14% in passengers carried and 12.7% in passenger-miles, and Wiggins, down 22.4% and 18.1%, respectively. Lake Central's passengers increased 5.2%, while passenger-miles decreased 11.3%.



**San Juan, Puerto Rico**, will soon have a new airport. When completed in June, 1954, the new \$15,000,000 field will give Puerto Rico one of the largest and most modern aviation centers in the entire Caribbean. The new \$3,000,000 terminal building is expected to handle over 600,000 tourists and business men a year by 1960. The field comprises about 1,200 acres of land less than 15 minutes drive from San Juan. Only 500 acres are presently being allocated for aviation use, but the Transportation Authority is considering plans to lease parts of the tract for recreation parks, bathing pavilions, or other income-producing purposes.



**HE'S SINKING  
AN UNSEEN  
SUB**

DESIGN ENGINEERS started with the latest electronic gear to seek a submerged sub and the armament to sink it. Around this mass, they created an aircraft. With slide-rule and calculator, they flew her on paper.

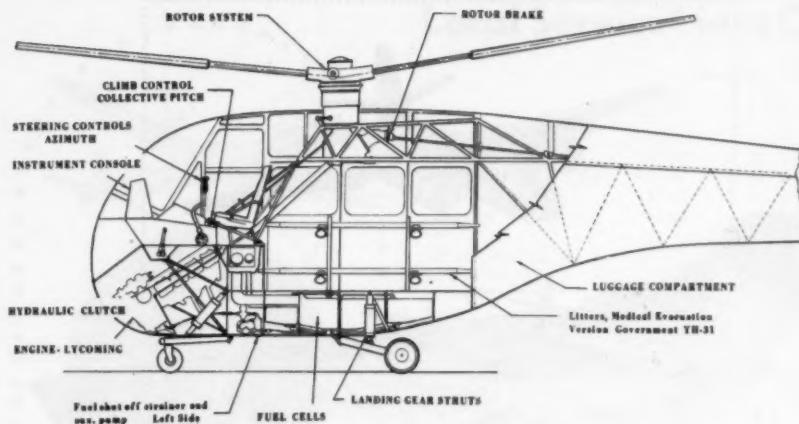
From these flights in figures, and from models in wind tunnels, came data demanding change. Often formulae gave the answer, often the ingenuity of Grumman specialists in aerodynamics, structures, weight control, metallurgy, and production.

They detailed her anatomy, until all her thousands of parts were in lines and numbers. These became metal, hand cut and formed with precision. Carefully the first experimental model was built.

Before the Grumman S2F-1 flew and confirmed their figures on paper, they were busy on a revolutionary new fighter plane.

Grumman salutes National Engineers Week.

GRUMMAN AIRCRAFT ENGINEERING CORPORATION • BETHPAGE • LONG ISLAND • NEW YORK  
MARCH 2, 1953



NEW BOEING ENGINES will go into LZ-5 frame (above).

## Twin-Engine Doman 'Copter Coming

New version of the LZ-5 will be powered by two Boeing turbines to boost reliability and speed.

**A**TWIN-ENGINE version of the Doman LZ-5 is now on the drawing boards at Doman Helicopters, Inc., in Danbury, Conn. The new ship will be powered by two late-model Boeing 502 turbine engines rated at over 200 horsepower each and installed within the framework of the existing design.

Major effect of the new configuration will be to give twin-engine reliability to the eight-place helicopter while increasing take-off gross weight by about 750 pounds and cruising speed by about 30 miles per hour.

Like the earlier model Doman helicopters, the LZ-5 and YH-31, the new

model will be built as a private venture, but interest of the Army Field Forces, which will probably have to assure availability of the turbine engines, should guarantee its future.

In the accompanying drawings Doman releases first detailed information on the nature and construction of its rotor system, the real selling point in the Doman helicopters. This rotor system eliminates the blade flapping hinges, drag hinges, and hinge dampers which have caused considerable trouble in other models. In the process of developing this design Doman has come up with a number of other features, such as

an efficient ejector type exhaust system to improve engine performance, which have generated additional interest in the company.

Release of data on its plans for a twin-engine version of the LZ-5 highlights activities at Doman Helicopters, where seven years of developmental work on a completely new type rotor system are just beginning to pay off. The first assurance that these efforts would pay off came with the \$500,000 Army Field Forces contract for two of the LZ-5 helicopters "off the shelf."

Actually the shelves were bare when this contract was signed late in 1952. Up to that time the main thing which Glidden S. Doman's infant company had to display was a converted Sikorsky R-6, on bailment loan from the U. S. Army, which was fitted with one of the Doman hingeless four-bladed rotors.

A more impressive vehicle, designed and built by Doman, was in storage at Curtiss-Wright under the terms of a Doman/Curtiss-Wright contract. This was the LZ-4 with which Doman and Curtiss-Wright were to have entered the military helicopter field in a big way. Other military production developments at C-W terminated the deal.

A converted Sikorsky R-6 seems like a doubtful sales tool on which to market a new type helicopter yet to be built. But this is just what Doman president Glidden S. Doman and his associates did. Present results include:

- Fabrication of two LZ-5 helicopters for the Army Field Forces well under way;

- Production jigs for large scale production being built;

- Transmissions and other critical components for eight or 10 other helicopters now in the shop;

- A new factory soon to be started adjacent to the present Doman hangar, which Doman had been sharing with another firm (meanwhile Doman has taken over the remainder of this hangar, virtually doubling its space).

- Indicated assurance of a sizeable production order out of the Army's fiscal 1954 funds.

Starting point for the entire venture was when Doman, an engineer with Sikorsky during World War II, conducted extensive strain gage tests on the R-6 rotor system. His findings and subsequent reports convinced him that a new approach to rotor design was needed. Sikorsky listened sympathetically, considered the findings, but in the light of postwar demands declined to redesign its basic rotor system.

### How Performances Compare

#### DOMAN YH-31 (Military Version) Gross Weight 4419 lbs.

Maximum speed—90 knots (104 MPH)  
Cruising speed—75 knots (86 MPH)  
Maximum rate of climb—1300 ft./min.  
Service ceiling—18000 ft.  
Retrieving radius for two litter patients—240 miles

Hovering ceiling (no ground effect)—  
8500 ft.  
Hovering ceiling (in ground effect)—  
13000 ft.  
Cruising range (fuel, 67 gals.)—220 miles  
Maximum endurance—3.7 hours

#### DOMAN LZ-5 (Commercial Version)

Maximum speed—85 knots (98 MPH)  
Cruising speed—75 knots (86 MPH)

Hovering ceiling (no ground effect)—  
4000 ft.  
Hovering ceiling (in ground effect)—  
8000 ft.

### How Weights Compare

	YH-31	LZ-5
Empty weight	2860 lbs.	2860 lbs.
Gross weight	4419 lbs.	5000 lbs.
Useful load	1559 lbs.	2140 lbs.
Crew (two)	400 lbs.	(one) 200 lbs.
Passengers (two in litters)	500 lbs.	(six seated) 1020 lbs.
Fuel 66.7 gals.	400 lbs.	300 lbs.
Oil	54 lbs.	54 lbs.
Misc. and baggage	205 lbs.	566 lbs.
Permissible CG travel	10 in.	10 in.

### MAIN ROTOR HEAD ASSEMBLY

- (1) Hub
- (2) Planetary reduction gears
- (3) Constant velocity universal joint
- (4) Hub gimbal
- (5) Blade pitch bearings
- (6) Blade spar tube
- (7) Pylon support tube
- (8) Azimuth drive boot
- (9) Azimuth plate
- (10) Azimuth gimbal
- (11) Blade pitch rods
- (12) Collective pitch bearing housing
- (13) Drive shaft
- (14) Controls enclosures
- (15) Main transmission housing
- (16) Main drive shaft (from engine)
- (17) Universal joint
- (18) Free-wheeling clutch
- (19) Rotor tachometer generator take-off
- (20) Rotor oil pump
- (21) Spiral bevel pinion shaft
- (22) Spiral bevel reduction gear
- (23) Spiral bevel tail rotor take-off gears
- (24) Rotor brake
- (25) Tail rotor drive shaft

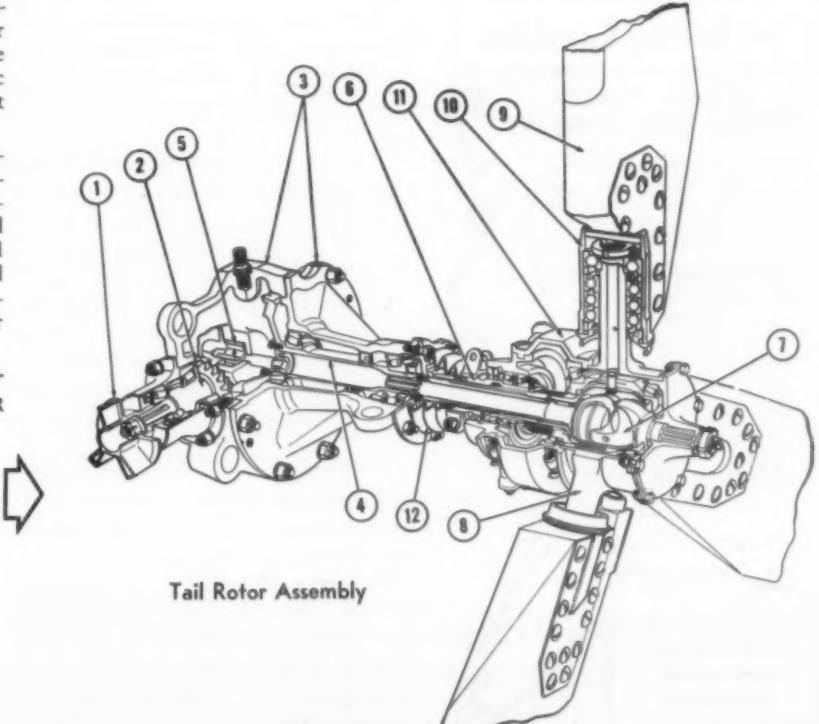
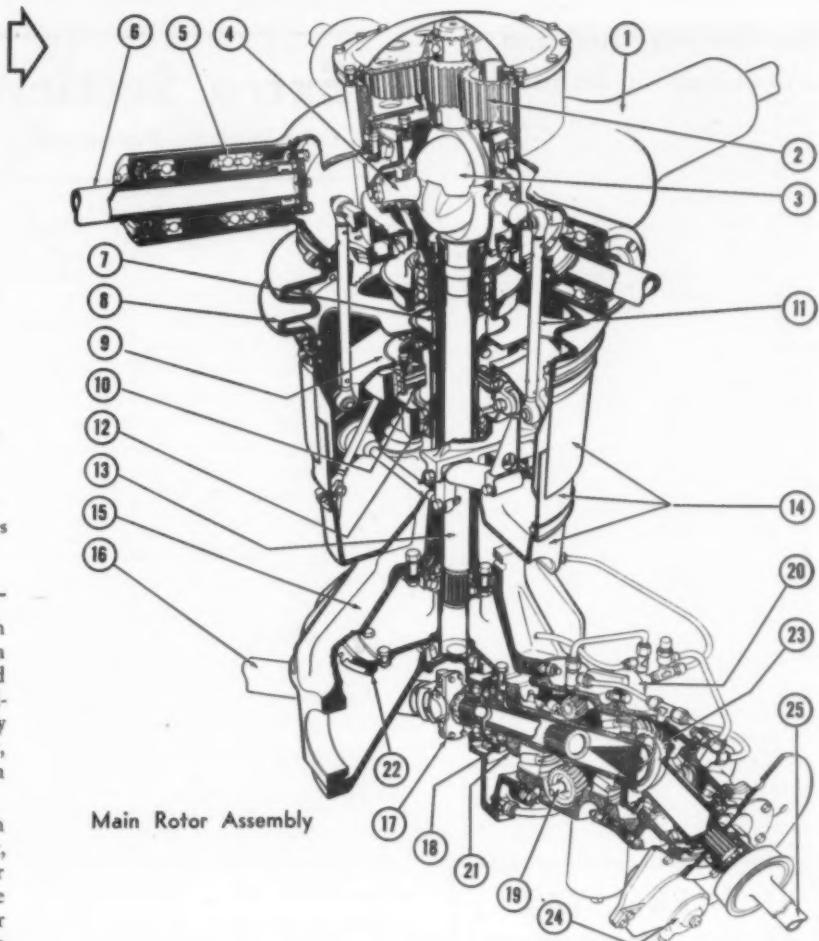
Doman resigned his post with Sikorsky and started work designing a rotor system which he felt would solve many of the problems he visualized in existing types. After many paper designs which were never built, Doman came up with the basic system used in today's Doman helicopters.

Measuring 48 feet in diameter, with an individual blade area of 18.4 feet, the Doman four-bladed hingeless rotor system has a disc area of 1,810 square feet and solidity ratio of .0407. The rotor speed is 182.5 revolutions per minute at 3,000 rpm engine speed. Power loading of the YH-31 is 11.05 pounds per horsepower at take-off and that of the LZ-5 is 12.5 pounds. The rotor disc loading is 2.44 pounds per square foot for the YH-31 and 2.76 for the LZ-5.

Instrumented flight tests have established that rotor blade life will be infinite, Doman claims. Further, the construction of the rotor hub with speed reduction gearing built in, forced oil lubrication of all bearing surfaces, and similar features assures lower maintenance requirements. Removal of cover plates makes gearing accessible.

### COMPONENTS OF THE TAIL ROTOR ASSEMBLY—LZ-5

- (1) Input coupling
- (2) Pinion shaft
- (3) Two-piece right angle housing
- (4) Gear shaft
- (5) Oil pump
- (6) Pitch control sleeve
- (7) Constant velocity universal joint
- (8) Hub
- (9) Blade
- (10) Blade root and bearing pack
- (11) Rotating boot
- (12) Stationary boot



## The Fueling Question: Grounding or Bonding?

A proposal that aircraft fueling procedures call for bonding the fuel nozzle to the airframe, instead of the more elaborate bonding and grounding methods now used, remains a highly controversial issue. A recent poll of National Fire Protection Association members found 28 members supporting the new technique, while twenty-two favored the present "Y" method of grounding the airplane to the fuel truck and both the airplane and the truck to a point of "zero electrical potential."

Referred to the Civil Aeronautics Administration by the NFPA, the issue is slated for handling by the National Advisory Committee for Aeronautics at some indefinite future date, when needed information is secured by CAA from the military services (Navy BuAer is understood to favor bonding only and the Air Force to be partial to grounding).

Whether or not there will be a research program to decide once and for all the merits of the "bonding" method will depend on the NACA.

**7¢ FUEL TAX  
NOW EXEMPTED  
in South Carolina**

**REFUEL WHERE  
PRICES ARE LOWEST!**

Refuel on the eastern seaboard in South Carolina where retail fuel prices are the lowest and where airport facilities and service are unexcelled.

**MAXIMUM PRICES\***

80 oct.	31¢	90 oct.	32¢
100 oct.	33¢		

\*Many dealers offer lower prices on quantity purchases.

South Carolina—Midway between New York and Miami

**SOUTH CAROLINA  
AERONAUTICS  
COMMISSION**

## Extra Section

By William Perreault



BOARDING an American Airlines' DC-6 in New York, British European Airways' chief maintenance engineer Hugh Gordon selected one of the "safer" aft-facing seats (which have gained more favor in Britain than they have in the U.S.). It wasn't until the next morning that he realized that the passenger sitting opposite him in a forward-facing seat was none other than Hugh De Haven, director of the Cornell Crash Injury Research Foundation. De Haven was en route to Detroit, the same destination as Gordon, where he presented a paper in which he went on record with his opinion that we ultimately will see aft-facing seats safer and more comfortable than any forward-facing seats we have today.

The 1,500 people who attended the annual Honors Night dinner of The Institute of the Aeronautical Sciences at the Astor Hotel in New York recently agreed that the dinner chairman, Wellwood Beall, deserves the top aviation award of the year. He kept the program down to exactly 51 minutes, an all-time low. Last year's program dragged for one hour and 43 minutes; others have gone longer than that. Beall, senior vice-president of Boeing Airplane Company, decided something should be done—and did it.

Forty-one major military and civil aircraft accidents involving fire took place in 1952, taking the lives of 354 people and costing in excess of \$54 million, according to the National Fire Protection Association. NFPA uses one-quarter of a million dollars loss in determining what fires are "large loss fires." Of the 41 accidents in this class, 32 were experienced by the USAF, with seven B-36 and three B-47 fire accidents contributing two-thirds of the dollar loss. Crash fires were the most numerous, involving some 21 accidents and 250 fatalities. Fires originating in flight accounted for 16 incidents and 104 deaths. Four ground fires included two \$3½ million B-36's which were destroyed, and one \$700,000 fire on a Constellation. Two of the ground fires occurred during fuel servicing operations.

An interesting piece of maintenance advice on rattling seats was included in the address by TWA president Ralph S. Damon before The Newcomen Society of North America, a society which aims at increasing appreciation of American-British traditions and ideals in the arts and sciences. Speaking of the early days of Transcontinental Air Transport, TWA's predecessor, Damon said: "On one occasion, a ticket agent, commenting on the sparsity of passengers, complained to an engineer of the line that the planes were too noisy, even the seats rattled. The engineer's retort was: 'Keep the seats filled and they won't rattle.'"

There is little doubt that air traffic control is one of the more complex subjects with which most operations people are confronted. It includes elements of many different types, including instrumentation for communications and navigation. For the initiated, it's involved. For the person with borderline interests, it's next to impossible to keep informed on the subject. In this light we've received an informative and well presented document on the whole history and science of air traffic control. Titled "The Air Traffic Story," the 150-page book is available from the Radio Technical Commission for Aeronautics at 1724 F Street, N.W., Washington, D.C., at 50¢ per copy. It reduces the control of traffic to understandable terms which everyone should appreciate.



## **VULCAN NEEDED AN ANVIL...**

But Philco forged a mighty weapon with a change of name! When the Armed Forces needed vast quantities of Microwave Radio Relay equipment, Philco's standard commercial product met the exacting requirements without change! Philco *Advanced Design* Microwave already contained JAN-approved components and military type plug-in assemblies. So with only the change of name from Philco *Advanced Design* Microwave to AN/TRC-30, it was ready for military use.

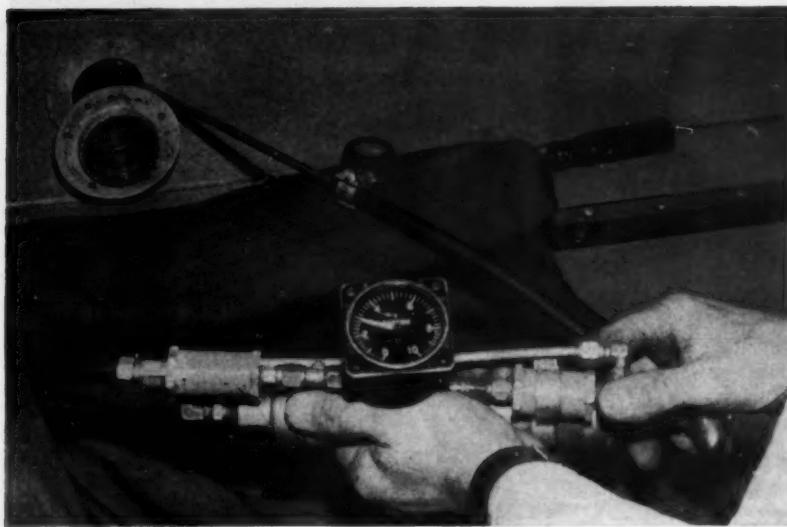
Philco Microwave equipment is designed for utmost reliability, flexibility and ease of maintenance... qualities demanded without compromise by the Armed Forces. Philco's ability to surpass these rigid standards provided the Armed Forces with an immediate source of vital communications equipment.

Today, as always, forward-thinking Philco stands ready to develop and produce advanced electronics equipment to meet any need of the Government and the Armed Forces.



**PHILCO CORPORATION**  
GOVERNMENT AND INDUSTRIAL DIVISION  
PHILADELPHIA 44, PENNSYLVANIA

# Maintenance Bulletin Board



## TWA Device Checks Window Fogging

A Trans World Airlines' device for checking the cabin window dessicator system in Lockheed model 049 airplanes has proved itself in alleviating window fogging problems by pointing out maintenance deficiencies in the system. With the test equipment, which is made up of a hand vacuum pump, check valve, suction gage, and filter, TWA has been able

to isolate system troubles during periodic maintenance checks and to institute this four-point program to improve system dependability:

• Installation of anti-collapse springs in the dessicator tubes, permitting longer service life from the tubes, which were otherwise found to weaken and collapse from age.

• Improved maintenance of window cavity frames, which are often found with deep scratches or dents or with excessive paint and cement build-up preventing the "O" ring from making a good seal. New procedure specifies no painting or cement to be used on the inner periphery of the cavity frame. Any scratches found must be blended out and dents eliminated.

• New inner window assembly procedures calling for a special jig to provide an evenly distributed load around the window and seal while the unit is being assembled. Dented and distorted frames and rivets which were not flushed were found by the check, along with paint and cement build-up, all of which would cause excessive drag when installing the window.

• Improved installation of the  $\frac{1}{4}$ " Sierracain outer window. When making the installation, TWA found many openings where the panel would not fit properly, a condition which was corrected to provide proper fit and to permit the window to be installed with all screws evenly loaded and tightened enough to provide a weather seal.

The TWA procedure for checking a window installation using the vacuum pump test kit calls for:

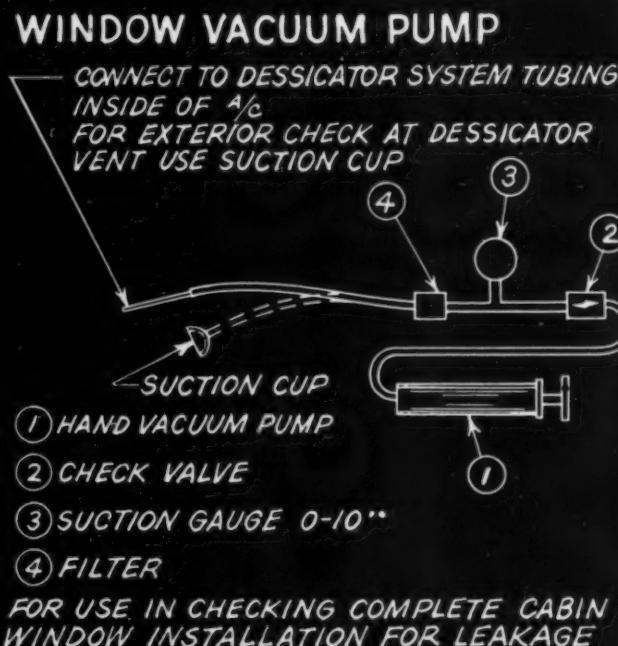
• Placing the suction cup over the dessicator outlet fitting directly below the cabin window and on the exterior skin.

• Operating the vacuum pump until gage registers two inches to three inches Hg. Watch outer window closely, as it will buckle inward if installation does not leak. If gage holds pressure, there is no leakage.

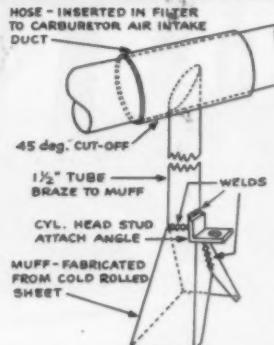
• Where leakage is evident, checking window as first source and dessicator next, the latter check being made from the interior (see photo) using the test assembly. With the dessicator removed, the apparatus is connected to the dessicator-to-window tube, to determine whether the window installation does or does not leak.

• If no leakage is found, checking the dessicator unit for leakage by connecting the test unit to one of the outlets, blocking the other outlet with a finger. Leaks may be found in the cap seal, cracked disc plug, or at dessicator tube connections.

• Checking dessicator tubes for leakage, general condition, and presence of anti-collapse springs. Springs should extend to within  $\frac{1}{2}$ " of each end of tube.



#### HEAT MUFF FOR GROUND POWER UNIT



### Heat Muff Stops Carburetor Icing

Carburetor icing of Motor Generator Corporation model 666 ground power supply units has been reduced by one airline by the addition of a simple heat muff. Tracing the cause of the icing to insufficient heat to the carburetor resulting from the installation of the governor between the exhaust manifold hot spot and the carburetor, the airline fabricated and installed this simple muff (see sketch).

When installed the muff rests on the exhaust manifold for the No. 2 and 3 cylinders and is attached to the engine by means of a head bolt. Opposite end of 1 1/2" tube that is brazed to the muff is cut at a 45° angle with the low side of the cut facing the carburetor, and is inserted in the inlet air stream to the carburetor.

### Gear Down Indicator

Pilots of American Airlines' Douglas DC-6 type aircraft are given a visual means of determining that the nose landing gear is down and locked in event of warning light failure. AA is painting a 1/4" white stripe on the nose gear down latch links to provide this visual indication.

### New Kidde Inhibitor

Necessity for purging CB fire extinguisher systems after use is becoming a thing of the past with the use of a new inhibitor which eliminates the corrosive effect of CB fire extinguisher liquid on aluminum. With USAF approval for the new inhibitor already secured, all CB now shipped by Kidde contains the anti-corrosive feature.

MARCH 2, 1953



## Designed for dependability

... tested (and re-tested) for precision

KOLLSMAN devises, develops and manufactures high-precision **Aircraft Instruments and Controls** • **Miniature AC Motors for Indicating and Remote Control Applications** • **Optical Parts and Optical Devices** • **Radio Communications and Navigation Equipment**

While our manufacturing divisions are engaged largely in defense pro-

duction, the Kollsman Instrument Corporation welcomes the opportunity to apply its research experience to the solution of problems in instrumentation and control.



**KOLLSMAN INSTRUMENT CORPORATION**  
ELMHURST, NEW YORK

*Standard* COIL PRODUCTS CO. INC.

SUBSIDIARY OF

GLENDALE, CALIFORNIA

# Engineers



Roy W. Lessard, Assistant Chief of Design, Has had extensive aeronautical design and structures experience with many leading aircraft manufacturers and is part of the Fairchild engineering team.

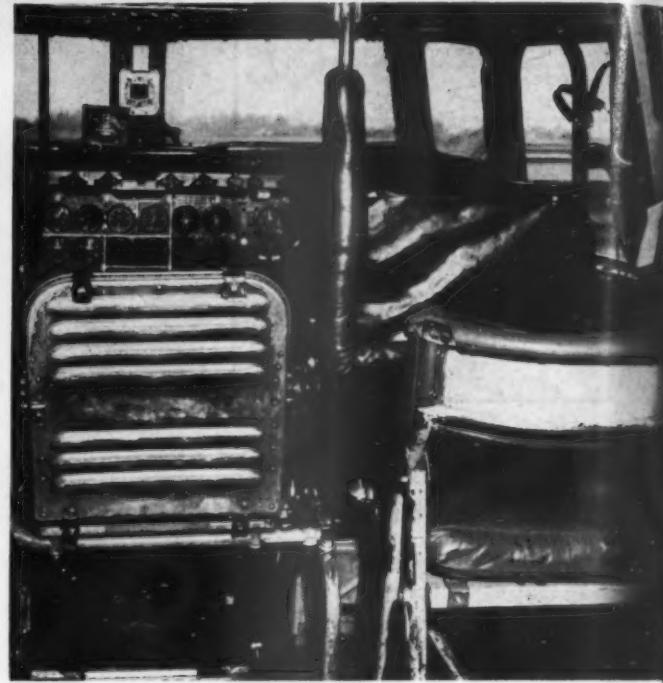


## AN INVITATION TO YOU TO GO PLACES WITH **FAIRCHILD**

A secure future, exceptional opportunities for advancement, and a high starting salary await you at FAIRCHILD. We have openings right now for qualified engineers and designers in all phases of aircraft manufacturing.

Paid vacations, liberal health and life insurance coverage, 5-day, 40-hour week as a base. Premium is paid when longer work week is scheduled.

**FAIRCHILD** Aircraft Division  
HAGERSTOWN, MARYLAND



## Pan Am May Test Prop Reverse System

Top level representatives of the Air Transport Association, the Air Line Pilots Association, and the Civil Aeronautics Administration met recently in Washington, D. C., to discuss the controversial CAA-proposed requirement of additional changes to propeller reversing systems. A day-long session concluded with the airline industry firm in its stand against further changes, as opposed to the ALPA position, which favored their adoption but only after a service test by one or more airlines on four-engine aircraft.

The possibility that Pan American

World Airways may conduct such a service test came to light following the meeting, during direct questioning by ALPA as to the individual airlines' positions on service testing. A PAA representative reported that Hamilton Standard had offered his company one or more propeller governors and that a service test probably would be conducted.

The CAA-proposed edict centers around a decrease pitch relief valve (AMERICAN AVIATION, January 19) which Hamilton Standard designed into the propeller governor to prevent in-flight propeller reversing.

### Extra crew member seat

installation for Douglas DC-6, as adopted by National Airlines, above, is leading to similar installations by other airlines, with American Airlines adopting the layout for its forthcoming coach conversions. Designed by NAL's chief engineer Howard Pike and project engineer J. G. Barber, it permits occupant of seat, normally a check pilot or CAA agent conducting a route check, to view entire cockpit operation. Other versions installed behind the flight engineer's seat do not. It involves removal of bulkhead behind first officer, at a weight saving of approximately 15 pounds. Applying about 100 engineering man-hours to the design, National's engineers selected a seat manufactured by Aero-Smith, Inc., of Miami, rated at six g's, to do the job. Standard "Wedgit" floor fittings manufactured by Monadnock Mills were used for seat attachment. National's plans for the Douglas DC-6 call for a similar installation with an improved seat also manufactured by Aero-Smith.

WORLD'S PREMIER AIRPLANE FABRIC  
**FLIGHTEX**

FLIGHTEX FABRICS, Inc. - 93 WORTH STREET - NEW YORK 13, N.Y.

Leading Manufacturers of  
Fabric and Tapes for the  
Aircraft Industry.

**FLIGHTEX FABRIC**

Export Representative  
AVIQUIPO, Inc.  
25 Beaver Street, N. Y.  
Cable: Aviquipo

### AA Tests TCP, Analyzer

American Airlines has consolidated its service test of Shell TCP (tricresyl phosphate) fuel additive with the installation of a Bendix Scintilla airborne ignition analyzer and a revised method of setting cruise powers. Analyzer installation has been confined to one airplane and voltage wave patterns are being photographed in special engineering tests to determine the effect on ignition performance of the TCP and the technique of setting cruise powers, called the seven BMEP drop method.

in

# SOUTH AMERICA

*Braniff does make the difference!*



Don't just take our word for it—ask Arnold C. Rigby.

Scanning a list of experts who've recently flown the hemisphere with us, we found the man who masterminds Boston's Arnold Tours.

We rushed the big question to him: "How was the trip and the treatment?"

Well, his answer was enough to warm the cockles of a well-traveled heart. He likened the South American trip to a thoroughbred and the Braniff treatment to the care and grooming that make a thoroughbred more so.

Mr. Rigby's on our team now. And we wish him the very best of everything when it comes to going places, or, better still, sending folks places!

Native dancers in an old hacienda near the Andes at Lima.



Mr. Arnold Rigby of Arnold Tours (right), president of ASTA's New England Chapter, gets a big "bon voyage" from Braniff Manager George Braender of Boston.



it's —————   
**BRANIFF**  
INTERNATIONAL AIRWAYS  
Love Field • Dallas, Texas

# How a jet engine runs on its "nerves"



From a jet's mighty engine, these precision gears "take off" power and pass it along to vital accessory equipment *at the specific rate required by each different unit*. As many as 30 separate gears . . . as many as 2500 separate machining and assembly operations . . . go into this gearbox so essential to safe, efficient operation of a jet. And for this tremendously complex production, Westinghouse depends on Lycoming.

Lycoming stands ready to assist *you*, too. Whether you have "just an idea" that needs development, a problem in the blueprint stage, or a finished metal product that needs precise, speedy fabrication . . . you can depend on Lycoming's long-tested ability to meet the most exacting and diverse industrial or military requirements. *Whatever your problem—look to Lycoming!*

**Lycoming's 2½ million feet of floor space**, its more than 6,000 machine tools, and its wealth of creative engineering ability stand ready to serve your needs.

AIR-COOLED ENGINES FOR AIRCRAFT AND INDUSTRIAL USES • PRECISION-AND-VOLUME MACHINE PARTS • GRAY-IRON CASTINGS • STEEL-PLATE FABRICATION

LOOK TO

**LYCOMING** FOR RESEARCH  
FOR PRECISION PRODUCTION

LYCOMING-SPENCER DIVISION  
BRIDGEPORT-LYCOMING DIVISION



WILLIAMSPORT, PA.  
STRATFORD, CONN.

Lycoming-Spencer Division  
AVCO Manufacturing Corp.  
652 Oliver Street  
Williamsport, Pa.



Please send me further information on Lycoming's varied abilities and facilities.

Name \_\_\_\_\_

Firm \_\_\_\_\_ Title \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

# New Products

## Thermocouple Tubes

Thermocouple protecting tubes fabricated of nickel alloy using only one half as much nickel as previous units have been announced by the Minneapolis-Honeywell industrial division. Minimizing the effect of government restrictions on the use of nickel, the new M-H tubes are made from Incoloy, an alloy similar to Inconel, but with 50% less nickel content. Rated at temperatures of 1,900° F., the new Incoloy is said to have a chemical composition similar to Chromel T which is rated at 2,000° F.

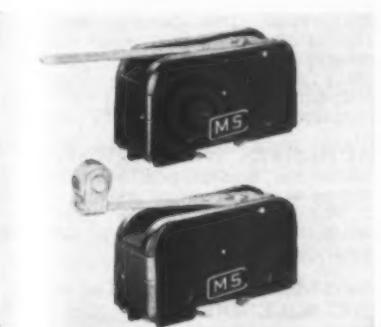
Address: Minneapolis-Honeywell Regulator Co., Industrial Division, Philadelphia 44, Pa.



## Resistors

Carbon film resistors sealed in glass envelopes, evacuated and baked at high temperature under vacuum, and then sealed in helium are announced by the Chase Resistor Company. Called Stablohm resistors, the new units are said to be stable to 0.01% under all environmental conditions and to have a long time drift of the same value or less per year.

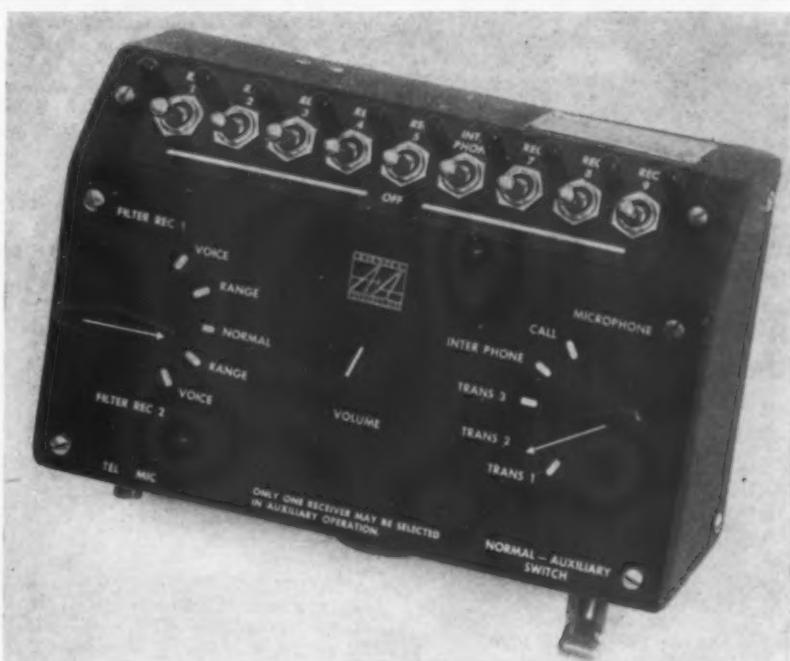
Address: Chase Resistor Company, 9 River Street, Morristown, N. J.



## Low-Force Switches

Low-force switches of the snap-action type, which can be operated by forces as low as  $\frac{1}{2}$  ounce, have been announced by the MICRO division, Minneapolis-Honeywell Regulator Company. Provided with rigid lever integral actuators which adapt them to actuation by cams or by straight-line motion, the new switches are said to be useful in timing clock motors, instruments and meters.

MARCH 2, 1953



## Radio Equipment

Aviation Accessories, Inc. of Fort Worth, Texas has announced three new items of airborne communications or navigation equipment, a model A1-100 isolation amplifier (shown above), an ADF 53 dual radio compass, and a model C-10500 ADF loop transmission line.

Featured in the new isolation amplifier is individual selection by each crew member of eight receiver outputs, interphone service, selection of three transmitter microphone circuits, and a call system between all crew members. Weight of the unit is  $3\frac{1}{2}$  pounds and price is \$275.00 list.

The ADF dual radio compass indicator is an autodyn type instrument, has

a three-inch dial, weighs 1 pound 7 ounces, and provides a scale graduated in two-degree intervals with all  $10^{\circ}$  marks finished in fluorescent green. Unit is priced by manufacturer at \$250.00 list.

Designed for use with the Aviation Accessories R-5/ARN-7 receiver, the new ADF loop transmission line consists of a special three-conductor polyethylene wire manufactured to close tolerances, two series inductances, and a fixed and variable condenser, with a cast aluminum box to house the components. The loop line is manufactured in six-, nine-, twelve-, and fifteen-foot lengths, with either a straight or a right angle plug on the loop end. Price is \$35.00.

Address: Aviation Accessories, Inc., P. O. Box 4178, Fort Worth 6, Texas.

Shown are type "W80" switches with a flat-lever actuator for operation by straight-line motion or by slow moving cams; type "W82" with a hardened steel roller on the end of the lever for reduction of friction in cam actuation; and type "W822" with a short roller lever actuator for fast cam actuation or for locations where compact installation and maximum resistance to vibration are required.

Ratings are 15 amperes, 125, 250, or 460 volts, d-c;  $\frac{1}{4}$  ampere, 250 volts, d-c. Switches are available with solder lug or screw terminals.

Address: MICRO Division, Minneapolis-Honeywell Regulator Company,

Freeport, Ill.

## Paint Primer

A paint primer developed to stop the peeling of polyvinyl chloride finishes from rusty steel, called Rustbond primer, has been introduced by the Carbofine Co.

Featuring almost perfect adherence to rusty steel, rust, or to sandblasted steel surfaces, according to the manufacturer, Rustbond reportedly possesses good corrosion resistance to most acids and, after aging, to all common paint removers including xylene and methyl ethyl ketone.

Address: Carbofine Company, 7603 Forsyth Blvd., St. Louis 5, Mo.

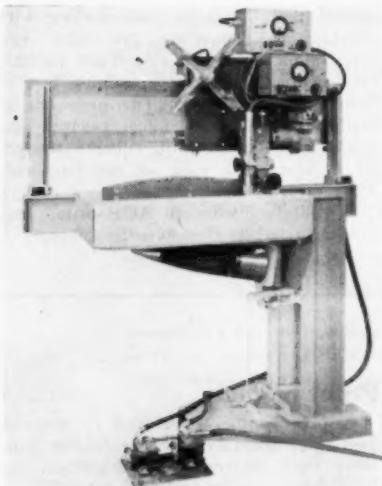


### Black Light Lamp

Black light unit for fluorescence analysis and examination of raw and processed materials has been placed on the market by the Cooper Hewitt Electric Company. Called the model 3660, which identifies the light wave length (angstrom) range in which it is furnished, the new Cooper Hewitt unit uses a quartz high pressure mercury arc tube in a sealed beam to furnish the desired wave length.

Visible light is eliminated by means of a Corning filter, which transmits only the bands in the region of 3660 angstroms. Unit is available for flood or spot focus and swivel arm permits settings in many directions and positions.

Address: Cooper Hewitt Electric Company, 720 Grand Street, Hoboken, New Jersey.



### Welding Jig

A Heliarc welding jig with end opening or gap feature permits welding of all longitudinal seams of any formed item with easy removal of resulting shape, according to its producer, the Mc Hale Manufacturing Company.

Consisting of a pneumatic work-

clamping jig, a power-operated welding head carriage, and Heliarc welding equipment, the Mc Hale jig is said to be particularly useful in manufacture of airplane parts, fire extinguishers, tubing, etc. Carriage of jig is adjustable for welding speed of four to 60 rpm on its horizontal track. Provisions for conversion to Heliarc spot-welding is included. The jig is said to produce consistently a weld capable of withstanding loads of 300 to 900 psi.

Address: Mc Hale Manufacturing Company, 3200-3220 E. Mines Avenue, Los Angeles 23, Calif.

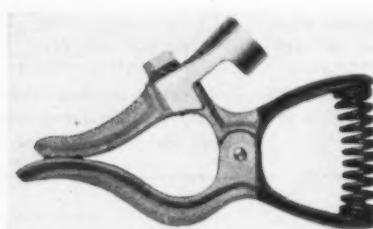


### Rectifier

An a-c to d-c rectifier designated the "MagniVolt" has been placed on the market by Inet, Inc. Built to operate on 115-volt, single-phase, 60-cycle current, the new rectifier models range from 1.2 volts to 28.0 volts, and from 2.5 amperes to 30.0 amperes.

Claiming better than one per cent regulation from no load to full load, response is said to be faster than 0.2 second, even under extreme contrast of load conditions. Ruggedness of new unit, according to manufacturer, is largely because of Inet-developed magnetic amplifier which contains no moving parts or vacuum tubes.

Address: Inet, Inc., 8655 So. Main St., Los Angeles 3, Calif.



### Arc Welding Clamp

An arc welding ground clamp, called the Model GC-200 "Cub," with a rated capacity of 200 amperes has been developed by Tweco Products Company. Following the basic design of other Tweco clamps, the "Cub" features a protruding upper lip for extra leverage in application, wide jaws for added conductivity, a serrated lower jaw which removes rust and scale as the clamp is applied, a strong fully insulated spring, and a simple bolt and clamp connection.

Address: Tweco Products Company, Box 666, Wichita, Kansas.

## Technical Literature

**SURFACE FORM GRINDER:** Bulletin 50226 presents features of Style 84 precision surface form grinder for grinding flat, grooved, or curved surfaces on the roots of jet engine compressor blades and turbine buckets in an automatic cycle. Available from the Ex-Cell-O Corporation, 1200 Oakman Boulevard, Detroit 32, Mich.

**STARTERS:** Jack and Heintz, Inc., Cleveland 1, O., describes its complete line of starters in technical bulletin J&H File No. 1500. Included are performance curves, cutaway drawings, and photographs of starters.

**ALUMINUM EXTRUSIONS:** Over 4,000 standard extruded aluminum shapes, rod, bar, and tubing are dealt with in a new 98-page book published by Precision Extrusions, Bensenville, Ill.

**TORQUE EQUIPMENT:** An 18-page catalog, including price list, covers details of torque testing equipment and torque tools manufactured by Richmont, Inc., 808 W. Santa Anita, San Gabriel, Calif.

**FLEXIBLE HOSE:** Three types of Flexhaust, spiral wire reinforced flexible hose, are outlined in illustrated catalog No. 35, put out by American Ventilating Hose Company, 100 Park Ave., New York, N. Y.

**FIBERGLAS PRODUCTS:** "Applications in Aircraft," prepared by Owens-Corning Fiberglas Corporation, Toledo 1, O., explains uses of Fiberglas materials and products in commercial, personal, and military airplanes.

**PROFILING MACHINES:** Ex-Cell-O Corporation, 1200 Oakman Boulevard, Detroit 32, Mich., has begun distribution of a new standard jet blade profiling machine which is discussed in Bulletin 50620.

**ADHESIVES AND COATINGS:** Minnesota Mining and Manufacturing Company, 411 Piquette Avenue, Detroit 2, Mich., presents an eight-page booklet describing uses for "3M" adhesives, coatings, and sealers.

**D-C SOLENOIDS:** The third edition of Cannon Electric Company's bulletin DCSS-1952 devotes 72 pages to 82 types of solenoids in shell diameters and 25 different coil windings for intermittent and continuous duty. Address it 420 West Avenue 33, Los Angeles 31, Calif.

**FITTING SHAPES:** Seventeen fitting shapes available in steel or aluminum alloy are described in Bulletin 4120-AL, which deals with MS aircraft fittings tube fittings manufactured by Parker Aircraft Company, 5827 West Century Boulevard, Los Angeles 45, Calif.

# It's always VFR for...



DE HAVILLAND DOVE

## DEPENDABLE ESSO AVIATION PRODUCTS!

Flying executives, private plane owners, commercial airline operators all recognize the famous Esso Wings. They stand for dependable service at Esso Dealer Airports and high quality Esso Aviation fuels and lubricants.

There are hundreds of Esso Dealer Airports staffed with trained, experienced operators offering prompt service with Esso Aviation Products — products backed by constant research at America's

largest petroleum research laboratory and proved by over 43 years of actual flying. You can depend on high quality Esso Aviation Products!

Wherever you fly, take along an Esso Aviation Credit Card and conveniently charge:

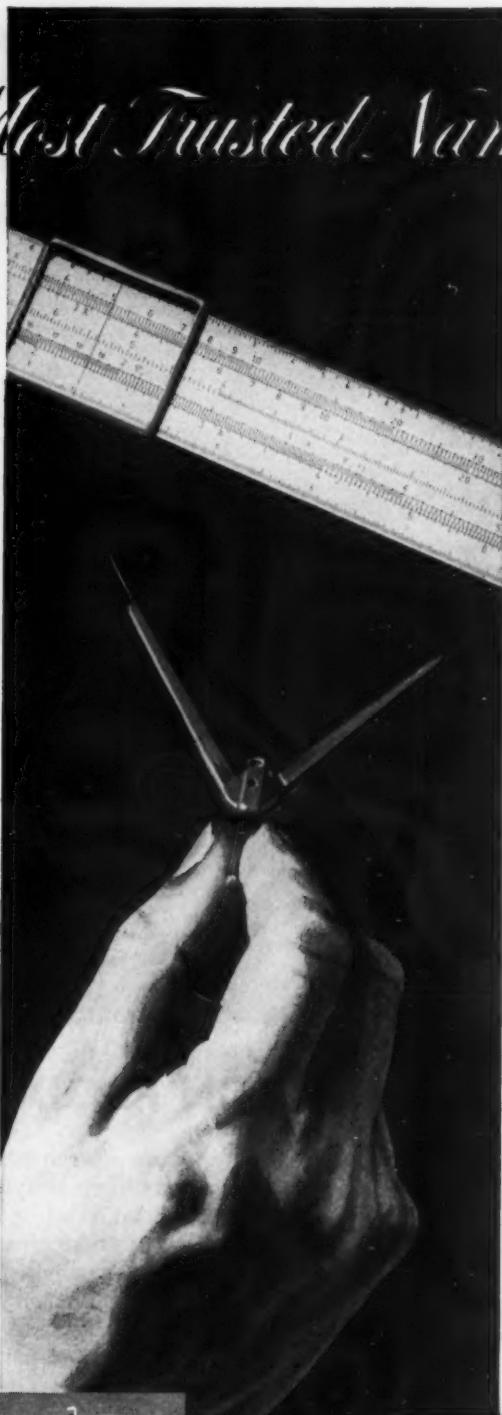
- Lubrication, tire and battery services.
- Landing fees.
- Over-night storage in transit.
- Minor emergency services.



TO GET THE ESSO CO-PILOT  
— complete directory of Esso Dealer Airports, write Esso Aviation Products, Room 428, 15 West 51st St., N. Y. 19, N. Y.



# The Most Trusted Name in Ignition



## in research, design and manufacturing

For over a quarter of a century, Bendix has set the pace in meeting the ever changing ignition problems of the industry. It is perfectly obvious that solutions to this perpetual challenge of product improvement and application can only be found by an unceasing search for advanced design, better materials and more efficient manufacturing methods.

How well Bendix has met this challenge is evidenced by the overwhelming endorsement the aviation industry has given to Bendix ignition equipment.

Whether the requirement is for a better electrical connector or a complete new ignition system, the industry has come to look upon Bendix as the one source best qualified to meet every ignition problem.

Remember, the unmatched facilities of Bendix are yours to command from planning to finished product.

### AVIATION PRODUCTS

Low and high tension ignition systems for piston, jet, turbo-jet engines and rocket motors . . . ignition analyzers . . . radio shielding harness and noise filters . . . switches . . . booster coils . . . electrical connectors.

*Bendix*

### SCINTILLA MAGNETO DIVISION

SIDNEY, NEW YORK



Export Sales: Bendix International Division  
72 Fifth Avenue, New York 11, N. Y.

FACTORY BRANCH OFFICES: 117 E. Providence Avenue, Burbank, California • Stephenson Building, 6560 Cass Avenue, Detroit 2, Michigan • Brouwer Building, 176 W. Wisconsin Avenue, Milwaukee, Wisconsin • 582 Market Street, San Francisco 4, California

## TRAFFIC BRIEFS

TWA on April 26 will start daily Constellation tourist service between Burbank and New York with a stop at Chicago. American Airlines had previously announced similar service, starting April 28, using 80-seat DC-6's.

British Overseas Airways Corporation starts once-weekly Comet service London-Tokyo on April 3, and will add a second weekly flight April 13. Comets will make the 10,200-mile trip in 33½ hours (26½ hours flying time) against 80 hours taken by BOAC Canadairs.

Transocean Air Lines has established main-land Honolulu special commodity air freight rates which it says are the lowest in its history. Included is a 30c per pound rate for confectionery in 100-pound lots, and newspapers, magazines, and periodicals in 500-pound lots moving from Burbank, Oakland, or San Diego to Honolulu. Rate is 20c per pound for foliage and 30c for cut flowers from Honolulu to the three cities, with 25-pound minimum.

Western Air Lines' January passenger traffic was the heaviest in its history, up 18.2% over same 1952 month, and 32.5% over January, 1951.

Trans-Texas Airways had a record January, with traffic 21.5% over same month last year.

Lake Central Airlines was scheduled to open service to Gary, Ind., on Route AM-88 about February 28.

## PHOTO CREDITS

- Cover: Temco
- 15—McDonnell
- 16—Douglas
- 17—Lockheed
- 19, 20—Temco
- 26—Ham Stan
- 38—Douglas; Ham Stan; Lockheed
- 39—Ankers
- 42, 43—Piasecki
- 48—Puerto Rico
- 50, 51—Doman
- 54—TWA
- 72—Bristol; Info. Aero.

# Airline Commentary

By Eric Bramley



LOW-FARE air service is spreading, not only in the U.S. but elsewhere. It will be all over Europe this year and by 1954 will extend to most parts of the world.

We suggest that maybe the airlines should consider standardizing the name for this service, particularly in the international field. Maybe there's a need for two standards, one international and one U.S. domestic.

Leafing through the *Official Airline Guide*, we discovered that 14 airlines now use some form of the word "tourist"—either airtourist, air tourist, tourist class, or sky tourist. These lines are Air France, American, Avianca, Braniff, BOAC, El Al, KLM, Panagra, Pan American, Sabena, SAS, Swissair, TCA, and TWA.

Seven carriers use aircoach, air coach, or club coach—Capital, Delta, Eastern, National, Northwest, United, and Western. All of these are U.S. lines.

In Europe, with extension of low-fare service to most routes, why not call it "standard" and describe the higher-fare flights as "de luxe"? Or "second-class" and "first class"? Some people have told us that "tourist" or "coach" won't be easily understood, particularly in countries where the mother tongue is not English. Some travelers will think they actually have to be bona fide tourists to use the service. And the "coach" description isn't well known outside the U.S.

This might be something for consideration by IATA.

An attractive airline sales slogan this year is Braniff Airways' "53 in 53." Translated, this means that the company is looking for \$53,000,000 revenue in 1953. Coincidentally, when Bob Phinney, northern region sales manager was checking out of a Dallas hotel following the company sales meeting at which the slogan originated, he looked twice at his bill. The total: \$53.53.

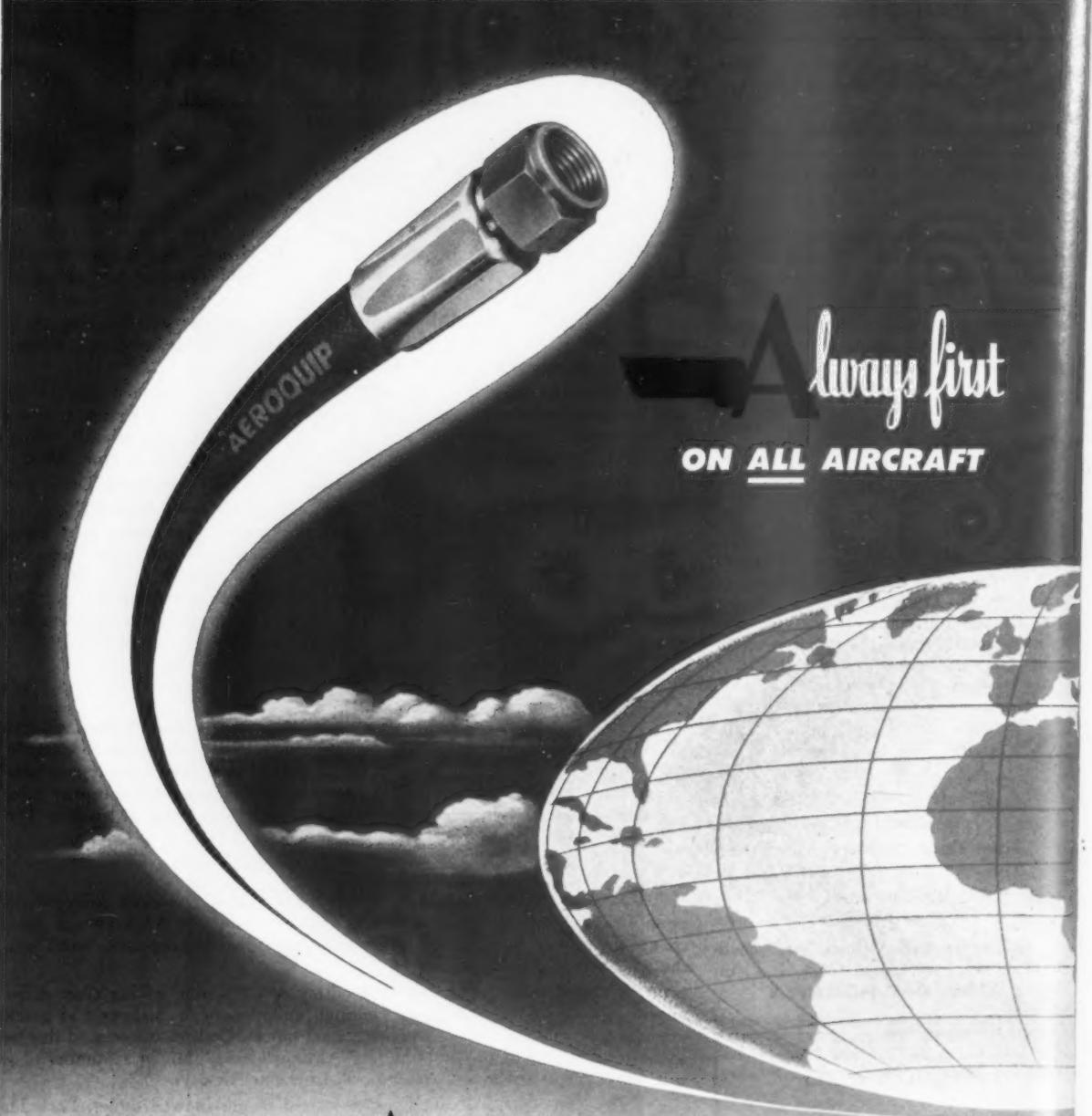
It was all an accident, but All-American Airways recently collected 100,000 pounds of clothing for flood victims in Holland. Not that AAA (which has since changed its name to Allegheny Airlines) wasn't glad to cooperate, mind you, but the whole thing was unexpected.

Walter Cronkite and Arthur Godfrey of CBS were asking their radio and television audiences to contribute clothing, and American Airlines had graciously offered to make collections through its ticket offices. Godfrey announced that people should take garments to "all American Airlines offices," but in a number of places this was interpreted as referring to All-American Airways.

The local service airline's offices started to get snowed under. Lock Haven, a town of about 12,000 in the flood-conscious part of Pennsylvania, contributed 9½ tons, and the AAA manager was frantically querying Washington headquarters for instructions. Johnstown had three tons. Clothing was stacked in offices, spare rooms, and even some hotel rooms.

Dave Miller, AAA's vice president-traffic and sales, put out an announcement that all offices would cooperate in the drive (he also took the opportunity to explain that AAA was changing its name). Clothing was forwarded to the nearest American Airlines' station by air where possible, and by surface where the volume was too heavy. AAA's final total, Dave tells us, was 50 tons, with Lock Haven in the lead.

Prize remark of the week: Just about the time the newspapers were carrying stories about spectacular volcanic eruptions in southwest Alaska, Bob Reeve, president of Reeve Aleutian Airways, was in Washington. We asked him if he'd heard about these developments in the territory over which he operates. "Yes, dammit," he replied, with one eye on business. "Why couldn't it have waited until the tourist season?"



AEROQUIP

Always first  
ON ALL AIRCRAFT

**Aeroquip**  
REG. TRADE MARK

**FLEXIBLE HOSE LINES with detachable, reusable fittings**

**AEROQUIP CORPORATION, JACKSON, MICHIGAN**

SALES OFFICES: BURBANK, CALIF. • DAYTON, OHIO • HAGERSTOWN, MD. • HIGH POINT, N. C. • MIAMI SPRINGS, FLA.  
MINNEAPOLIS, MINN. • PORTLAND, ORE. • WICHITA, KAN. • TORONTO, CANADA

AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

# CAB Studying NAL Mail Rate Case

The Civil Aeronautics Board has taken under advisement arguments of National Airlines, the CAB Operations Bureau, and the Post Office, on whether an alleged delay by CAB staff people in setting a final mail rate for National is properly an issue in determining the carrier's rate for a past period.

At issue, says National, are "millions of dollars." The line's attorney, John W. Cross, told CAB, among other things, that the National case was "side-tracked" by the CAB staff several years ago because of the "Big Four Mail Rate Case." He cited cases of other airlines, Braniff and Delta, that petitioned for final rates about the same time as National in

1947 and had their rates established effective April 1, 1948. National's rate was not set until January 1, 1952.

Cross claims this subjected 1950-51 profits to recapture by the Government because of the "open" mail rate period. A CAB attorney, however, Allen C. Lande, claimed immunity for the agency under the Federal Torts Claims Act which, he said, exempts the Government from claims for failure to perform discretionary functions.

Julian T. Cromelin, PO attorney, supported the CAB staff and said evidence of delay "has nothing whatsoever to do with the amount of mail pay to National in this proceeding."

## New York-Balboa Goes to Eisenhower

The Bureau of the Budget was putting the final touches on CAB's controversial decision in the New York-Balboa Through Service Proceeding as this issue went to press. Next step was submission of the matter to the White House for President Eisenhower's signature.

Twice before, the same CAB decision favoring Braniff-Eastern and National-Pan American-Panagra interchanges went to the White House only to be returned unsigned by then-President Truman. The

first time, reliable sources say, the case never got above the White House staff level.

The second time it was returned (January, 1953) was after Truman, subjected to considerable pressure on all sides, decided to give it back to CAB for re-submission to the new Administration. Petitions of Pan American, Panagra, and Eastern to have it reopened for further argument were denied by CAB.

## Resort Gets Stopover Rights at Miami

The CAB has granted Resort Airlines an exemption outlining stopover privileges for the line at Miami on southern tours conducted from the northeast to the Caribbean area. Action resulted from a December 24, 1952, directive from former President Truman in which he said it was his original intention that Resort have Miami stopover privileges under its temporary all-expense tour certificate.

The certificate was originally awarded to Resort in 1949 when Truman reversed an original CAB decision.

In granting the exemption, CAB instituted a proceeding to determine the scope of Resort's authority to grant stopovers at Miami. Fearful of turning the "overseas and foreign" certificate of Resort into one with "international" characteristics, CAB defined the carrier's interim exemption authority as permitting stopovers at Miami of two full days on cruises of ten full days' duration or more, and of one day on cruises of less than ten full days.

## Quick Action Seen On PAL Extension

CAB action on Philippine Air Lines' application for a San Francisco-Mexico City route extension is expected at an early date following public hearings in Washington which lasted only two hours and saw a minimum of opposition.

PAL's proposal is to extend its Manila-San Francisco flights on to Mexico City on a twice-a-week basis. E. T. Bolton, PAL vice president and the only witness to testify at the brief CAB hearings, estimated that approximately 20-22 passengers would be carried on each flight. He said DC-6 or DC-6B aircraft will be utilized.

## Revocation Delayed

Air Transport Associates, large irregular carrier headed by Amos E. Heacock, was granted an additional lease on its operating life recently when the U. S. Supreme Court recessed until March 9 without acting on Heacock's bid for reversal of a CAB revocation order.

## CAB News

### AS OF NOW

The transcript of oral testimony at hearings in the **Large Irregular Air Carrier Investigation** has passed the 12,000-page mark, over double that of any previous CAB case. But with the second Washington round of hearings still incomplete, a limited session still scheduled for Miami, and full session scheduled for Los Angeles and Seattle, the hearings have not even reached the half-way mark. They have been under way for six months.

A long-standing CAB proposal to investigate possibilities of a merger between **Bonanza Air Lines** and **Southwest Airways** will be activated in the fall by CAB, unless the parties come up with a voluntary proposal beforehand.

An enforcement case started by CAB against **U. S. Airlines, Inc.**, for alleged failure to comply with reporting rules, and which had been scheduled for public hearings early this year, has been dropped by the Board. Both the agency and the airline agreed to a procedure where a "cease and desist" order will prevail with U. S. complying in the future and filing "past-due reports" by May 15.

But one enforcement case almost certain to continue is that against **Air America, Inc.**, a large irregular carrier, in which hearings have just started. An offer of settlement was opposed by CAB enforcement officers, who claimed that no action by CAB short of revocation of Air America's letter of registration "would result in a termination of its course of conduct in violation of the law."

### CAB DECISIONS

• **South Pacific Air Lines** granted temporary exemption to operate scheduled air service between Hawaii and Society Islands using Solent Flying Boats.

• **American Airlines** granted continued exemption until February 24, 1954, to serve White Plains, N. Y., on routes 4, 7, and 25 through use of Westchester County Airport.

• **Eastern Air Lines**' motion for further argument in New York-Balboa Through Service Proceeding denied.

• **Munz Air Service** certificate re-issued to reflect name change to Munz Airways.

### CAB CALENDAR

Mar. 2—Hearing in Western Air Lines Final Mail Rate Case. Washington, D. C. (Docket 5148).

Mar. 3—Hearing in Trans-Atlantic Cargo Case (Seaboard & Western, et al.) Washington, D. C. (Docket 3041 et al.).

Mar. 4—Hearing in Continental-United Interchange Case. Washington, D. C. (Docket 5828).

Mar. 16—Hearing in Braniff-United Interchange Case. Washington, D. C. (Docket 5827).

# People

## AIRLINE

**Robert H. Wharton** has been named assistant to the president in charge of employee relations for Delta Air Lines. It will be Wharton's job to supervise the details of transferring certain Chicago and Southern Air Line employees from Memphis to Atlanta after the proposed Delta-C&S merger is effected.

**John G. Henwood**, former president of Flying Cargo, has been appointed general sales manager of U. S. Airlines, domestic scheduled all-cargo airline. Henwood will make his headquarters in USA's New York offices.

**John H. Keebler**, formerly administrative assistant to the vice president of sales, has been named to the post of director of catering and cabin service for National Airlines.

## MANUFACTURING

**Glenn E. Odekirk**, executive vice president and general manager of his own firm, the Southern California Aircraft Co., has been elected a director of Bardwell & McAlister.

**T. Z. Fagan** is the new director of sales and service for Scintilla Magneto Division of Bendix Aviation Corp. Fagan's former post, advertising manager, has been taken over by **Frank Rettberg**. At the same time **William A. Uline** moved from industrial sales manager to general sales manager.

**Ralph D. Rhea** has been appointed regional sales manager for South and Central America and Mexico for Collins Radio Co. Before joining Collins, Rhea was assistant director of operations for AVIANCA—The Colombian Airline, and before that he served eleven years with Pan American World Airways in various points in Central and South America.



Rhea



Carpenter

## MILITARY-GOVERNMENT

**Colonel John W. Carpenter III**, formerly vice chief of staff, is now chief of staff of the U. S. Air Force's Air Research and Development Command. Col. Carpenter succeeds Brig. Gen. Harris, now commanding general of the Air Research and Development Center in Tullahoma, Tenn.

**Ralph S. Trigg** has been named assistant acting director of the Office of Defense Mobilization where he will be responsible for production. Trigg was formerly acting administrator of the Defense Production Administration.



The following employes have recently completed 20 years or more of service in the aviation industry:

• **Chauncy D. Pippinger**, Pan American World Airways. Flight dispatcher, Miami. 25 years.

• **Lewis William Goss**, Trans World Airlines. Director of properties, Los Angeles. 25 years.

• **John Myers**, Trans World Airlines. Foreman, line maintenance, Los Angeles. 25 years.

• **R. F. Ahrens**, United Air Lines. Vice president-personnel, Chicago. 25 years.

• **J. D. Gillian**, United Air Lines. Captain, Los Angeles. 25 years.

• **R. A. Hirschowitz**, United Air Lines. Lead shop mechanic, San Francisco. 25 years.

• **Mary Morse**, United Air Lines. Accountant, Chicago. 25 years.

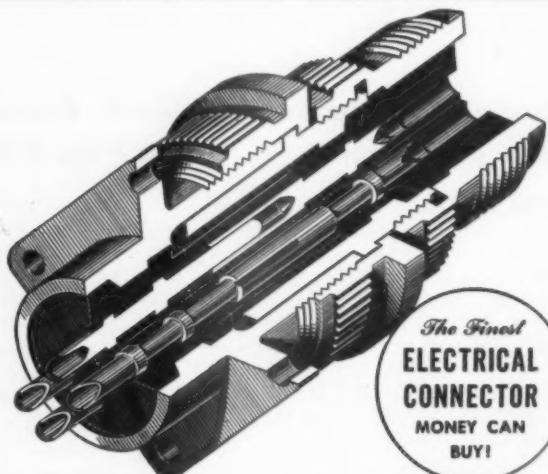
• **G. I. Myers**, United Air Lines. Special assignments, Denver. 25 years.

• **D. W. Martin**, United Air Lines. Supervisor of mechanical service, Chicago. 25 years.

# SCINFLEX ASSURES YOU THE LOWEST VOLTAGE DROP IN THE INDUSTRY!

When operating conditions demand an electrical connector that will stand up under the most rugged requirements, always choose Bendix Scinflex Electrical Connectors. The insert material, an exclusive Bendix development, is one of our contributions to the electrical connector industry. The dielectric strength remains well above requirements within the temperature range of  $-67^{\circ}\text{F}$  to  $+275^{\circ}\text{F}$ . It makes possible a design increasing resistance to flashover and creepage. It withstands maximum conditions of current and voltage without breakdown. But that is only part of the story. It's also the reason why they are vibration-proof and moisture-proof. So, naturally, it pays to specify Bendix Scinflex Connectors and get this extra protection. Our sales department will be glad to furnish complete information on request.

- Moisture-Proof • Radio Quiet • Single Piece
- Inserts • Vibration-Proof • Light Weight • High Insulation Resistance • High Resistance to Fuels and Oils • Fungus Resistant • Easy Assembly and Disassembly • Fewer Parts than any other Connector • No additional solder required.



The Finest  
**ELECTRICAL  
CONNECTOR**  
MONEY CAN  
BUY!

# BENDIX SCINFLEX ELECTRICAL CONNECTORS

*Bendix*

SCINTILLA MAGNETO DIVISION of  
SIDNEY, NEW YORK

Export Sales: Bendix International Division, 72 Fifth Avenue, New York 11, N. Y.  
FACTORY BRANCH OFFICES: 118 E. Providencia Ave., Burbank, Calif. • Stephenson Bldg., 4540 Cass Ave., Detroit 2, Michigan • Brouwer Bldg., 176 W. Wisconsin Avenue, Milwaukee, Wisconsin • 582 Market Street, San Francisco 4, California



AMERICAN AVIATION

# Five Lines Gang Up on Baggage Problem

Half the mishandled bags go astray at interline connections; new techniques tried by Capital.

By ERIC BRAMLEY

SOME of the domestic airlines are studying possible new methods of reducing the number of times passengers become separated from their baggage when transferring from one carrier to another.

It's considered probable that 50% of the industry's baggage mishandlings occur during interline connections (the other 50% is human error and poor training) and it's at this phase of the problem that the efforts are being directed.

Without fanfare, five airlines tried out a few new procedures at Chicago's Midway Airport late last year, and the results are now being studied. If any of the procedures are adopted, they could be applied at all major connecting points in the country.

One airline—Capital—has already revised its baggage handling somewhat along the lines of the Chicago experiment.

Interestingly enough the campaign to do something about baggage originated with an operations executive, rather than with someone in passenger service. James B. Franklin, Capital Airlines' vice president-operations, decided that complaints over mishandled bags had gone far enough and that there should at least be a discussion of the problems involved. He also figured that although complaints were received by passenger service, it was operations that actually handled (or mishandled) the bags.

Study showed that Capital's score on baggage was eight passengers mishandled out of every 1,000 (a mishandling was defined as a passenger arriving at destination without his bag). It also revealed that 50% of this was directly due to interline trouble.

Further analysis showed that about 80% of Capital's interline baggage trouble was caused by American, TWA, United, and Eastern, and that it was probable that Capital was contributing in like measure to those carriers' woes.

In a day-long meeting in Franklin's Washington office, the Big Four and Capital decided to try to do something about the problem, and the experiment was scheduled for Chicago, the country's biggest connecting point.

One entirely new procedure was tried at Chicago: on connections, the receiving airline was made responsible for picking up connecting baggage from the

arriving carrier. This is directly opposite to present practice.

Reasoning behind this change was that the receiving line probably has more interest in seeing to it that baggage is properly handled than the arriving line, which has already carried the passenger.

The other principal innovation was a daily report of mishandlings. This report was circulated among the airlines in the experiment so that each could see where mishandlings were occurring—which trips were the worst offenders and why.

Although actual statistics aren't available, results of the experiment were encouraging. They're now being studied to see whether it will be possible to adopt them permanently.

Another procedure, although it wasn't tried at Chicago, was suggested by the experiment and is under consideration—a joint transfer area for baggage. This might be a central area, or separate areas, where airlines would place transfer bags. Delivery of bags to connecting carriers would be accomplished either by a pool of agents or porters on the airlines' payrolls, or handled under contract by an outside agency.

## New Procedures

Meanwhile, Capital has adopted new procedures which, although placed in effect only a few weeks ago, have already cut mishandlings from eight to seven per 1,000. They include:

- Assignment of an operations agent as a "baggage expeditor" at four principal connecting points—Washington, Pittsburgh, Detroit, and Chicago.

- Adoption of a new on-line baggage tag, similar to the one now in use for interline transfers.

- Capital's station managers at major connecting cities are pointing out to their counterparts in connecting airlines all instances in which bags fail to transfer.

- The stewardess is informing a passenger when his bag has not transferred with him, and telling him why it didn't transfer.

Capital's "baggage expeditor" is stationed at the first convenient point past the ticket counter—the first place he can get an accurate check on bags. In Washington, for example, he's at the bottom of the baggage chute. It's his job to account for all originating baggage

as well as all connections. If connecting baggage isn't at Capital's baggage area when the Capital trip is ready to load, it's his responsibility to go to the other carrier and locate it.

Thus Capital in effect has assumed responsibility for seeing that connecting bags are placed aboard. If for any reason it's impossible to locate the bag by departure time, this agent informs the stewardess.

The stewardess in turn informs the passenger that his bag was not transferred, rather than letting him find out at destination. If possible, he's also told why the bag didn't transfer—if it's the other airline's fault he's told so. Capital is willing to have the other airlines adopt the same system, naming Capital if it's guilty.

## New Tag

The new on-line baggage tag has several coupons instead of the usual two (one attached to the bag, the other given to the passenger). When a passenger makes an on-line connection—at Cleveland, for example—the connecting station lifts a coupon. If two transfers are made, both stations retain coupons.

This has two advantages. It alerts personnel that bags carrying these tags are to be transferred, and it also furnishes the means for narrowing down the search for a lost bag—if the bag has passed through a connecting station, that station will have a coupon.

Capital believes that its system can eliminate many of the interline mishandlings which, as stated, amount to four per 1,000. Improvement in the other four per 1,000 cases must come primarily from better training, because the possibility of human error will never be eliminated.

It remains to be seen what the Big Four and Capital can agree upon in the way of procedures, but the five-carrier meeting and the Chicago experiment represent the first action taken in a long time to explore ways of improving the baggage situation.

## Obituary

### JOHN C. COLLINS

John C. Collins, 48, former official and director of Mid-Continent Airlines, died on February 6.

Since resigning from MCA, Collins had been in private business in Sioux City, Iowa. He served as vice president-economic controls and secretary of the airline for several years. His resignation took place at the time of MCA's merger with Braniff last year.

## Domestic Airline Traffic for November, 1952

AIRLINES	REVENUE PASSENGERS	REVENUE PASSENGER MILES	AVAILABLE SEAT MILES	PASSENGER LOAD FACTOR	MAIL TON-MILES	EXPRESS TON-MILES	FREIGHT TON-MILES	TOTAL TON-MILES	REV. TRAFFIC	AVAILABLE TON-MILES	% AVAILABLE	REVENUE PLANE-MILES	SCHEDULED MILES	% SCHEDULED MILES COMPLETED
American	410,241	225,026,000	317,369,000	70.90	1,447,806	943,141	4,118,656	28,532,658	42,360,304	67,36	7,166,099	7,234,151	97.77	
Brannif	115,129	34,941,000	61,509,000	56.81	148,340	117,698	205,896	3,808,609	7,209,033	52,83	1,808,447	1,845,554	96.96	
Capital	163,266	52,085,000	88,017,000	59.18	145,105	251,425	376,216	5,746,634	12,159,746	47.26	2,118,147	2,046,325	96.85	
Carairair	8,073	66,000,000	1,257,000	48.71	1,017	...	1,736	55,811	133,823	43.72	51,829	48,860	99.23	
C & S	45,802	17,489,000	27,705,000	63.13	71,482	98,816	134,421	1,981,105	3,390,433	58.43	811,106	796,907	99.05	
Colonial	24,019	6,189,000	11,707,000	52.87	11,461	11,777	14,257	1,627,557	1,282,984	48.91	326,007	317,070	94.05	
Continental	27,698	10,680,000	20,347,000	52.49	36,354	16,017	67,779	1,136,245	2,372,665	47.89	699,362	663,030	98.62	
Delta	78,629	33,811,000	52,342,000	64.60	149,949	127,332	358,411	3,880,401	6,330,457	61.30	1,424,055	1,385,051	99.59	
Eastern	316,592	159,725,000	280,845,000	56.87	468,090	390,805	614,091	18,045,265	37,170,430	48.55	5,321,576	5,276,645	98.68	
Hawaiian	23,817	3,115,000	5,721,000	54.54	2,525	...	107,113	370,453	730,015	50.75	280,840	227,272	98.91	
National	55,129	32,982,000	64,683,000	55.63	101,830	44,392	936,968	4,351,779	8,098,279	53.74	1,404,301	1,409,693	97.23	
Northeast	32,609	6,364,000	11,277,000	56.43	10,957	20,722	19,289	641,372	1,127,765	56.87	380,256	400,835	90.46	
Northwest	70,988	46,500,000	77,889,000	59.70	305,423	161,121	390,022	5,438,822	9,129,377	59.57	1,285,117	1,456,902	93.30	
Trans Pac.	10,552	1,318,000	3,835,000	34.37	958	8,272	113,661	325,258	349,496	136,964	130,690	97.60		
TWA	210,836	164,283,000	244,390,000	67.22	954,619	760,650	1,509,298	18,943,834	30,718,438	61.67	4,912,920	5,066,309	95.82	
United	257,466	163,491,000	250,335,000	65.31	1,583,573	956,120	2,338,663	20,447,741	37,645,213	56.32	5,726,884	6,145,347	91.08	
Western	60,876	23,431,000	37,043,000	63.25	118,574	56,435	72,581	2,485,233	3,947,497	62.96	1,035,460	1,067,225	96.57	
TOTALS	1,932,342	985,001,000	1,556,361,000	63.29	5,558,033	3,956,356	10,764,669	116,607,160	204,131,925	57.12	34,939,088	35,519,864	96.24	

\* Includes air parcel post.

NOTE: Figures include both scheduled and non-scheduled operations.

## International Airline Traffic for November, 1952

AIRLINES	REVENUE PASSENGERS	REVENUE PASSENGER MILES	AVAILABLE SEAT MILES	PASSENGER LOAD FACTOR	U. S. MAIL TON-MILES	FOREIGN MAIL TON-MILES	EXPRESS TON-MILES	FREIGHT TON-MILES	TOTAL TON-MILES	REV. TRAFFIC	AVAILABLE TON-MILES	% AVAILABLE	REVENUE PLANE-MILES	SCHEDULED MILES	% SCHEDULED MILES COMP
American	8,984	6,512,000	9,586,000	67.92	14,349	3,673	389	173,747	895,405	1,324,683	67.59	209,799	224,813	96.33	
Brannif	3,105	7,245,000	15,028,000	48.23	42,247	4,921	...	85,037	934,995	2,108,066	44.35	344,977	354,709	97.26	
C & S	1,984	2,449,000	6,302,000	38.86	5,041	901	...	104,546	366,846	872,530	42.04	136,594	139,260	98.09	
Colonial	2,073	1,615,000	2,737,000	59.01	1,500	394	...	5,271	181,829	328,134	55.41	53,296	44,335	97.51	
Eastern	7,903	11,620,000	22,069,000	52.65	37,967	...	...	12,937	1,253,562	3,435,162	36.49	361,861	358,759	98.88	
National	5,242	1,707,000	3,793,000	45.00	1,205	...	4,525	16,068	197,070	480,597	41.01	62,532	62,880	99.08	
Northwest	5,683	10,266,000	17,584,000	58.38	107,920	43,125	25,464	785,291	2,065,251	3,159,656	65.26	502,286	481,964	93.66	
Panagra	9,830	11,630,000	20,135,000	57.76	31,657	25,794	...	211,094	1,575,232	2,701,531	58.31	493,120	478,478	99.90	
FAA	58,807	54,841,000	94,011,000	58.33	266,987	65,095	...	2,249,093	8,018,481	12,973,485	61.81	2,112,670	1,744,875	98.25	
Latin Amer.	*	46,182,000	83,452,000	55.36	486,397	126,204	...	1,017,653	6,508,105	11,677,962	55.73	1,530,112	1,543,690	94.73	
Atlantic	*	27,088,000	43,365,000	62.47	351,940	56,193	...	583,398	3,997,198	7,294,861	54.79	873,749	876,710	99.66	
Pacific	7,929	13,395,000	10,793,000	40.35	34,377	...	...	467,869	963,074	1,533,443	62.80	245,255	246,270	99.59	
Alaska	3,910	4,355,000	...	...	...	...	...	...	...	...	...	...	...	...	
TWA	11,882	29,950,000	51,909,000	57.70	357,400	133,001	...	722,346	4,438,567	6,584,836	67.41	1,162,190	1,161,908	98.59	
United	3,628	8,996,000	12,261,000	73.37	53,969	...	...	39,682	1,052,848	1,599,684	65.82	233,340	257,930	89.40	
TOTALS	130,960	224,456,000	393,027,000	57.11	1,792,956	459,301	30,378	6,474,032	32,448,464	56,074,608	57.87	8,321,561	7,970,591	97.28	

\* Figure not yet available.

\*\* Includes air parcel post.

NOTE: 1. Figures include both scheduled and non-scheduled operations. 2. Data in above tabulations were compiled by American Aviation Publications and non-scheduled operations. 3. Figures for American Airlines include that carrier's service to Mexico but not to Canada; for Braniff to South America; C & S to South America; Colonial to Bermuda; Eastern to Puerto Rico; National to Havana; Northwest to Crient and Honolulu, and United to Honolulu. Operations of U.S. carriers into Canada are included in domestic reports to CAB, in accordance with CAB filing procedures.

## Local Service Traffic for December, 1952

AIRLINES	REVENUE PASSENGERS	REVENUE PASSENGER MILES	AVAILABLE SEAT MILES	PASSENGER LOAD FACTOR	MAIL TON-MILES	EXPRESS TON-MILES	FREIGHT TON-MILES	TOTAL TON-MILES	REV. TRAFFIC	AVAILABLE TON-MILES	% AVAILABLE	REVENUE PLANE-MILES	SCHEDULED MILES	% SCHEDULED MILES COMPLETED
Allied	12,216	1,789,000	5,138,000	34.81	6,390	11,830	2,826	188,668	587,251	32,13	244,688	269,773	86.95	
Bonanza	4,624	1,135,000	3,395,000	33.43	3,196	2,421	...	116,884	377,124	30.99	135,788	141,188	95.45	
Braniff**	3,187	589,000	1,569,000	37.54	1,954	2,042	3,888	64,184	163,771	39.19	68,238	82,956	82.26	
Central	3,535	524,000	3,231,000	15.97	4,000	1,474	5,019	57,493	374,940	15.33	156,225	161,634	96.65	
Frontier	10,453	2,976,000	8,036,000	37.01	11,901	6,983	28,712	331,406	765,730	43.28	384,959	389,980	95.83	
Lake Central	2,259	380,000	1,527,000	24.89	2,708	5,920	...	44,128	174,579	25.28	72,893	78,492	86.32	
Mahawk	9,177	1,578,000	4,223,000	37.37	2,890	5,979	6,580	160,856	428,472	37.54	175,970	168,575	96.05	
M. Central	10,096	1,687,000	4,965,000	35.97	9,262	15,063	...	184,219	567,406	32.47	236,426	330,274	73.50	
Oskar	6,859	1,172,000	5,351,000	21.88	4,142	5,257	16,446	118,860	469,822	25.30	214,042	241,708	87.70	
Piedmont	19,201	4,604,000	9,661,000	48.13	9,921	11,775	16,446	478,793	1,093,115	43.80	455,464	468,466	96.77	
Pioneer	14,703	4,083,000	11,084,000	36.84	14,473	5,413	13,708	423,934	1,077,601	39.34	307,886	319,536	96.13	
Southern	9,688	1,766,000	5,522,000	31.98	9,083	9,669	...	187,673	598,368	31.36	262,961	276,320	94.59	
Southwest	11,498	2,250,000	4,325,000	52.02	9,503	3,579	6,718	234,438	494,232	47.43	205,930	219,283	91.24	
Trans-Texas	6,216	1,415,000	4,696,000	30.14	7,165	2,516	6,339	151,900	536,700	28.30	224,642	238,948	93.59	
West Coast	9,216	1,607,000	5,551,000	28.95	3,852	1,958	3,162	156,587	494,271	31.68	264,437	296,174	89.20	
Wiggins	204	20,000	131,000	15.27	95	119	...	2,068	13,967	14.81	33,549	46,417	70.55	
TOTALS	133,132	27,572,000	78,359,000	35.19	100,535	92,998	90,398	2,902,091	8,217,349	35.32	3,444,098	3,729,914	90.83	
BAS	• • •	• • •	• • •	• • •	2,966	• • •	• • •	2,866	5,748	49.86	28,815	32,647	88.26	
Los Angeles	• • •	• • •	• • •	• • •	4,817	• • •	• • •	4,817	12,428	38.76	29,516	30,977	94.26	
N.Y. Airways	• • •	• • •	• • •	• • •	1,547	• • •	• • •	1,547	5,297	29.21	13,244	16,624	79.66	

\* Formerly All American Airways. Change in name was effective February 10, 1953.

\*\* Figures cover operations of local service route 106 now operated by Braniff Airways as result of Braniff-NCA merger, effective Aug. 16, 1952.

NOTE: Above figures include both scheduled and non-scheduled operations.

# International Report



VISCOUNT 800 is the stretched-fuselage version of the 700 series. Reduced range is compensated for by increased payload.

## BEA Buys 12 Viscounts; Options Eight

British European Airways has ordered twelve Vickers Viscount 800 turboprop transports and holds an option on another eight. The order, with spares, is worth more than \$15,000,000. The twelve planes will be delivered by October, 1955, and will be assigned to BEA's shorter routes (including those from London to Paris, Brussels, Amsterdam, Dusseldorf, Nice, Zurich, Geneva, Belfast, Edinburgh, and Glasgow).

The Viscount 800 is essentially a stretched-fuselage (13 ft. two in. longer) version of the 700 series, 26 of which have been ordered by BEA; the first was handed over to the airline on February 11. It was designed for greater loads over shorter stages than the present Viscount. Powered by a Rolls Royce Dart R.D.a.5 improved version of the Dart giving 1,540 shp and 1,690 ehp, the Viscount 800 will gross 65,000 pounds and will carry 66 to 82 passengers according to layout; the new engine attains the additional power through a three-stage turbine.

Development of the RD.a.5 Dart enables Vickers-Armstrongs Ltd. to offer yet another version of the Viscount—the Viscount 750, a model using the 700 series airframe and the new engines. It will be particularly suitable for tropical operations due to more power being available for take-off and climb (climb performance is the least impressive part of the specs for the 700 series).

The present overhaul period of the Dart is 400 hours, but Rolls-Royce expects that it will be 500 hours by the time the Viscount goes into regular service. Overhaul of each engine, if performed by Rolls-Royce, costs about \$7,000 and thus, since the aircraft has four engines, the total cost for each 500-hour overhaul is about \$28,000.

The BEA Viscount 800 order brings the total number of Viscounts ordered to 80. Vickers-Armstrongs states that additional orders could be accepted for deliveries before the end of 1955. Rolls-Royce, however, is less confident that quantity production of the RD.a.5 will be possible by that date.

Range and payload figures point up the basic difference between the Viscount 700 and 800 series (allowing for 45 minutes stand-off at 5,000 feet and 230 miles diversion):

Viscount	Viscount
800	700
350 miles ....	16,100 lbs.
700 miles ....	13,400 lbs.
1,100 miles ..	10,300 lbs.
1,550 miles ..	8,400 lbs.

## Giant 'Copter Planned

A 450-passenger military model is one of three helicopter projects announced by Westland Aircraft Ltd., which builds Sikorsky rotorcraft under license in England. Specs call for an empty weight of 92,000 pounds and a

gross of 206,000 pounds.

Proposed powerplant would be an Armstrong-Siddeley Sapphire turbojet at each rotor blade tip. A smaller design, with two Armstrong-Siddeley Adders at each blade tip, would gross 60,000 pounds. Smallest of three projects is a civil helicopter accommodating 36 passengers and powered by two Bristol Hercules piston engines driving a single rotor.

## Sabena to Take Delivery On First DC-6B Soon

Sabena Belgian Airlines will soon take delivery of the first of eight Douglas DC-6B's, which will add more than one-third to the total passenger-carrying capacity of the carrier's present 50-plane fleet, enabling trans-Atlantic seating capacity to be stepped up by 75%.

This summer there will be nine weekly Sabena round trips between Brussels and New York—six all-tourist flights in 77-passenger DC-6B's, and three de luxe 40-passenger DC-6 flights.

For Sabena 1952 was the most successful of 29 years of operations: passenger ton-miles were 22% above the 1951 level, whereas mail ton-miles were up 35%. Cargo traffic was also greater than in 1951, and big increases are expected when Sabena's two new DC-6A Liftmasters come into service.

## Japan to Buy Abroad

Japan's National Security Force and Coastal Security Force (embryo Japanese air force and naval air arm, respectively) are to be equipped with 121 aircraft under procurement contracts to be submitted to parliament.

The program calls for the purchase abroad of 100 aircraft and 21 helicopters, in addition to about 110 planes which the U. S. Far East Air Force is expected to lease to the Japanese government later this year.

The Japanese Advisory Commission on Aircraft Production, whose chairman is the Minister of International Trade and Industry, has criticized the plan to buy foreign planes, pointing out that the domestic aircraft industry could supply the planes and should be supported by the government.

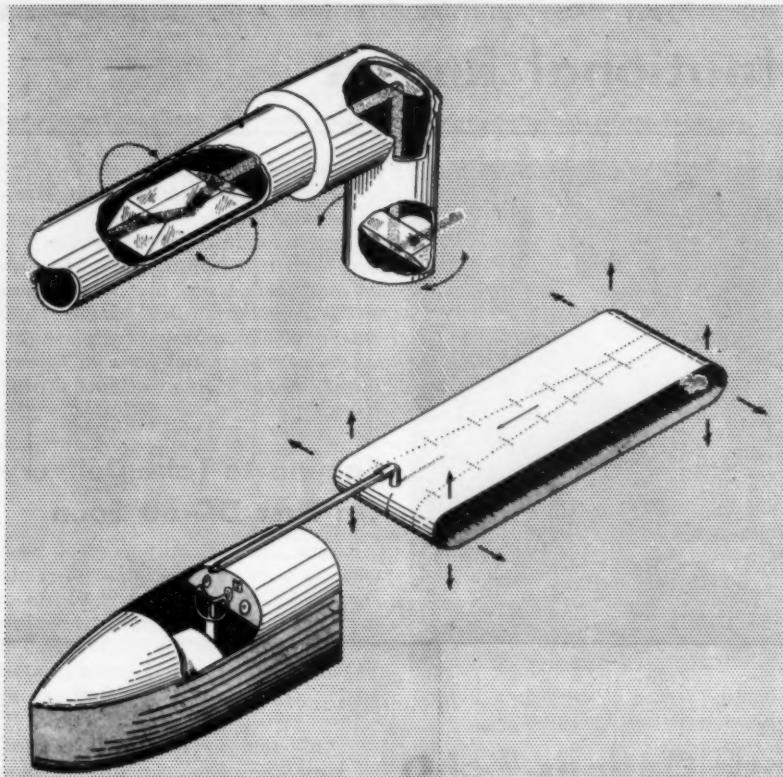


DIAGRAM of Kinorama shows prisms (above), moving belt (below).

## New Solution to Approach Light Tussle?

Device simulates approach systems in realistic motion; helps evaluate worth and train pilots.

**H**OW TO TRAIN pilots in the use of approach lighting systems and how to evaluate the worth of such systems are two problems that may be on their way towards cheap, safe, and convenient solutions. What promises to be the answer, in large part, is a new device called the "Kinorama," developed by the National Bureau of Standards in co-operation with the Navy Bureau of Aeronautics.

Essentially a moving belt studded with spots of fluorescent material, which a pilot in a Link trainer sees as though through a haze of fog, the Kinorama promises to save time, money, and, perhaps, pilots.

The protracted wrangling that has been going on over the various proposed approach-light systems gave rise to the project. Tests have been run already on three "over-run" lighting systems designed at the Wright-Patterson Air Force Base, a study has been made of longitudinal and transverse markings for runways, and three approach-light sys-

tems proposed for standardization by the International Civil Aviation Organization are under study.

In working with the Kinorama, the pilot sits in a Link trainer and peers through a long telescope of virtually no power. This is not as unrewarding as it might seem. The objective lens of the telescope is set close to a moving belt upon which fluorescent material has been placed, so that the pattern duplicates the appearance of the lighting system being studied. As the pilot "approaches" the runway the moving belt is tilted and turned and prisms in the telescope are twisted to correspond to the motions of the controls in the trainer.

To simulate fog, which fortunately or unfortunately, cannot be depended upon to appear when pilots are being trained in real aircraft, the Kinorama varies the supply of ultra-violet light which is directed upon the moving belt from above. Since this light causes the fluorescent patches to glow, less of

it is applied to that distant end of the belt and more of it upon the parts closest to the observer, giving him the impression that the farthest lights are partly hidden in fog. No provision has been made to simulate the effect of broken patches of fog, although this could be done if desired.

The fact that the Kinorama is a moving system is its chief advantage over various static systems that have been proposed for the study of approach lighting. The latter offer a picture of the lights as they would appear to a pilot of a helicopter or a fixed balloon; for anyone else the question is, how will the lights look as they rush toward you during an actual approach, during the vital 17 seconds between the time when they first become visible and the time when you can make out the runway lighting? The Kinorama offers a relatively realistic picture, including the effect of perspective in three-dimensional systems, such as slope-line lighting.

### Two Models

So far two models of the Kinorama have been developed by the NBS under the direction of Frank C. Breckenridge; a laboratory model, built around the airframe of an actual aircraft, which showed that the mechanics of the idea were practical, and a prototype, built around a Link trainer.

With the prototype all the vertical and horizontal movements of the pilot's approach are indicated by reciprocal movements of aluminum-alloy frames, upon which the belt is mounted (see photos). The angular movements are duplicated very simply by twisting prisms within the long telescope.

A recorder keeps a record of all movements so that the effectiveness of each system can be studied in detail.

The simulated landing can start from any one of three different altitudes and three different transverse positions, giving a total of nine situations, a number that is sufficient to cover a wide variety of problems. With each of the nine situations there is a pre-determined yaw, bank, and pitch.

The Kinorama's only competitor in the field is a device called a cyclorama, which has been in use in England. The cyclorama, however, is limited to systems built in a single plane, and thus cannot cope with slope-line lighting.

Some bugs are still being ironed out of the Kinorama, and no plans have been made as yet for putting it into quantity production.

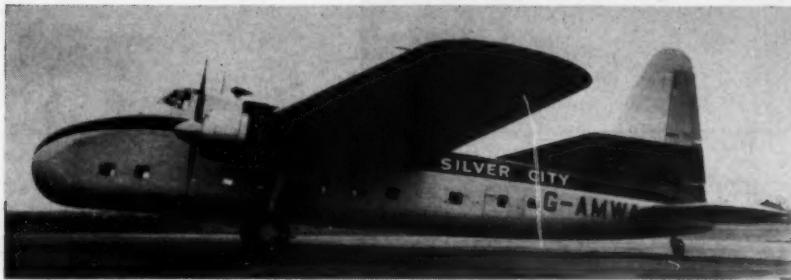
If and when the Kinorama does come into general use, both as a tool for evaluating systems and as a training aid, NACA feels that it may have made a significant contribution toward bringing both arguments and aircraft down to earth.



**Multiple Exposure** photo shows range of wing-sweep variation of Bell X-5 in flight. More than 60 flights have been made during tests at Edwards Air Force Base, Calif., where plane is being used for research into subsonic speeds and aerodynamic effects of changing the angle of wing sweepback in flight. Bell, the Air Force, and the National Advisory Committee for Aeronautics are participating in the tests.



**Test Vehicle** used in high-speed parachute drop tests to develop a technique of recovering the Ryan Q-2 high speed remote-controlled pilotless jet planes intact after each target run is being attached to Air Force launching plane in photo at left. Release mechanism in tail cone of vehicle houses drag and main chutes. Drawing of plane's parachute descent is shown above.



**Bristol 170** Super Freighter is a stretched-fuselage version of the well-known Freighter and Wayfarer. There is an increase in fin area and power to compensate for the longer nose, enabling take-off weight to be 44,000 pounds instead of 40,000 pounds.

#### INTERNATIONAL BRIEFS

Brazil's REAL airline is seeking designation as the **Brazilian flag carrier** for the Brazil-Japan route. Reciprocal operations by a Japanese carrier are expected to start shortly after the conclusion of a bilateral air agreement between the two countries.

REAL is interested in acquiring Douglas DC-6B's for the trans-Pacific route, which would lead from Sao Paulo to Tokyo via Rio de Janeiro, Belem, Port of Spain, Miami, Houston, San Francisco, Honolulu, and Wake.

The **first direct service** between Brazil and Japan will probably be that of Canadian Pacific Air Lines (via Lima, Mexico City, and Vancouver) which is expected to start this summer.

**A helicopter service** in Chile linking the downtown areas of Santiago and Valparaiso is under study by Linea Aerea Nacional; 10-passenger rotorcraft would be used. Meanwhile the Chilean airline is reconsidering its program to buy modern pressurized equipment to inaugurate operations to the U.S. Chile's dollar shortage may prevent the company from buying anything more modern than used Douglas DC-4's which would be operated within Latin America, notably to inaugurate a service to Lima, Peru.

**Japan Air Lines** has decided to acquire a controlling interest in Japan Helicopter Transport, Kyokuto Airlines, and Tokyo Airlines, three of the small members of the Japanese air transport industry.

Under JAL's present program, JHT will operate local service routes connecting Tokyo with Hamamatsu, Nagoya, Osaka, and Sapporo, and a service between Tokyo and Karuizawa; Kyokuto will fly from Osaka to major cities on Shikoku and Kyushu; and Tokyo Airlines will operate local service routes in the Tokyo area.

Latest news from Air France is that its 49-passenger Vickers Viscounts may be used on the Paris-London route; the turboprop transports will also fly routes from France to Switzerland, Germany, Austria, Italy, Greece, and Turkey.

The French-built **Breguet Deux Ponts** will soon go into service in the Mediterranean area carrying 59 tourist passengers on the upper deck and 48 second-class passengers on the lower deck.

**Irish flag trans-Atlantic operations** will be inaugurated by Aerlinte in 1954, using Lockheed Super Constellations and crews of Seaboard & Western Airlines.

The Irish carrier originally planned to start operations between New York, Boston and Shannon in April, 1953, using S&W Douglas DC-4's. The U.S. Civil Aeronautics Board recently restricted to two years the agreement between Aerlinte and S&W.

Now being readied for flight testing is a **French rocket fighter**—the SNCA du Sud-Ouest SO 9000 Trident, a cigar-shaped plane which is powered by four rockets installed in the rear.

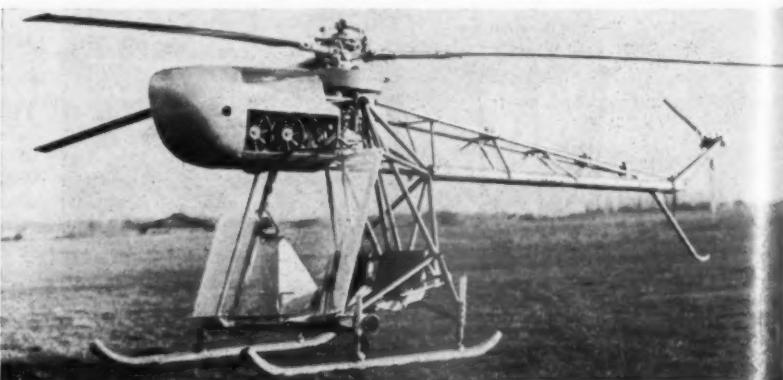
Auxiliary power is provided by a Turbomeca Marboré at each wingtip.

Entries for the London-New Zealand international air race scheduled next October include a Lockheed Constellation by Qantas Empire Airways, a Vickers Viscount by British European Airways, a Douglas DC-6A by KLM Royal Dutch Airlines, a DC-6B by Sabena Belgian Airlines, and a Handley Page Hastings by the Royal New Zealand Air Force. In the speed section the RAF has entered three English Electric Canberras and a Vickers Valiant. The Royal Australian Air Force has also entered Canberras.

License production in Europe of the **Sikorsky-S-55** helicopter will be speeded by an agreement between Westland Aircraft Ltd. and SNCA du Sud-Est, under which the British company will handle main assembly work. The French firm will supply certain components, some of which may come from continental European subcontractors.

A. V. Roe Canada has type-tested two new versions of the Orenda turbojet—the Orenda 8 for the CF-100 all-weather fighter and the Orenda 10 for the Canadair license-built version of the North American F-86 Sabrejet. The first five Orenda engines for the Sabrejet were recently shipped to Canadair two months ahead of schedule.

Flight testing of the **de Havilland DH 110** all-weather fighter is to be resumed. The trials have been suspended since the last Farnborough show when one of the two prototypes crashed. Although there are no production orders for the DH 110, the design has interested several potential customers.



**New French helicopter**, the Matra-Cantinieau MC 101, has completed 15 hours in the air and is now being equipped with a 135 hp Continental in place of the previous 105 hp powerplant.

## SIMPLICITY in hydraulic pump design is important for these reasons:

The Pesco hydraulic pump is a gear design—the simplest of all hydraulic pumps. There are actually only three moving parts in the pump proper. Fewer moving parts mean—

- ... less chance of pump malfunction
- ... less maintenance
- ... less cost for overhaul
- ... less weight
- ... less noise

## plus the EFFICIENCY of "Pressure Loading" which makes possible:

"Pressure Loading" is Pesco's exclusive development that *automatically* holds end clearance of gears to a thin film of oil, thereby maintaining the volumetric efficiency throughout the long service life of the pump.

- ... **volumetric efficiencies up to 97%**
- ... **over a wide range of temperatures**

## plus STATISTICAL QUALITY CONTROL which assures:

- ... **uniform high quality and performance of each pump**
- ... **a longer, trouble-free service life**

Simplicity of design, efficiency of "Pressure Loading" and statistical quality control in all phases of manufacture, are three important reasons why Pesco pumps are standard equipment on military and commercial aircraft and on many automotive and industrial products. Write today regarding your hydraulic pump requirements.



BORG - WARNER CORPORATION  
24700 NORTH MILES ROAD • BEDFORD, OHIO



# Operation Lifesaver"

Air evacuation of wounded men from front lines to rear area hospitals is possible today with the development of the Chase Assault Transport.

Casualties no longer risk wound complication or loss of life because of delayed evacuation, as modern techniques, made possible by the Chase C-123 Transport, move casualties directly from combat zones to base area hospitals. No other plane is built to take the brutal punishment of these hazardous front line assignments.

Combat infantrymen, quickly recognizing its unique value, dubbed it "Operation Lifesaver."



## Letters . . . . . (from page 9)

least one such machine is flying successfully in England, and several are in the prototype design stage, both in this country and in Europe, proposing both piston and turbine engines.

The point with which I take sharp issue is the strong statement that single-engine helicopters over congested areas are vulnerable to the same hazards as an airplane. This simply is not so. Actual experience in our own operation gives ample proof. We have made precautionary and emergency landings in parking lots, river beds, vacant lots, and what have you, under both day and night conditions. In almost every instance any machine other than the helicopter would have been wrecked, with possible serious or fatal consequences to the occupants. It is our opinion that this statement indicates pure and simple FIXED-WING THINKING and a lack of understanding of the helicopter.

• **Stability and Control . . .** Whatever problems exist in reference to either or both are solvable, in fact are now being successfully worked out, and when this is accomplished, the helicopter will be fully controllable, even at zero speeds, which the airplane appears to have pretty dim prospects of attaining. Let's take them individually:

**Control:** There is a sharp division among designers and pilots as to how much stability, if any, must or should be sacrificed in order to have maximum "sharpness" of control. Our boys have studied the situation objectively, particularly as it relates to our type of flying, with the unanimous consensus that sensitivity and sharpness are as important as stability, within reasonable limitations, of course. In either event, the industry is well along in gyro-pilot design, which has great promise of attaining complete mechanical flight.

**Stability:** This is an overworked issue, too. While undoubtedly there are many designs of helicopters which possess undesirable stability and control characteristics, I believe that a realistic appraisal would indicate that the majority of larger recent designs have no more worries in this connection than the airplanes, even at this state of the art. In riding the airlines, I frequently see seats blocked out because of delicate weight distribution, whereas in our S-55 operation, which involves perhaps more landings per hour and greater variation in CG than any conventional operation in the world, peculiarly, the stability problem, insofar as load is concerned, does not exist.

Now if the question is addressed to the combination of stability and control in regard to instrument operation,

the helicopter also is on very solid ground. For example, it is almost three years ago since our company proved the possibility, as well as feasibility, of full-scale instrument operation.

While all of the fine points of this have not been made public, I can tell you that we experienced no difficulty in keeping our boys under the hood for two hours or more at a time. We made approximately 100 landings in actual zero-zero conditions, and in perhaps as many instances navigated the machine to a pinpoint location on the edge of the surf of the ocean, on pre-designed "postage stamp" areas on the airport, and in several instances made simulated zero-zero landing on rooftops.

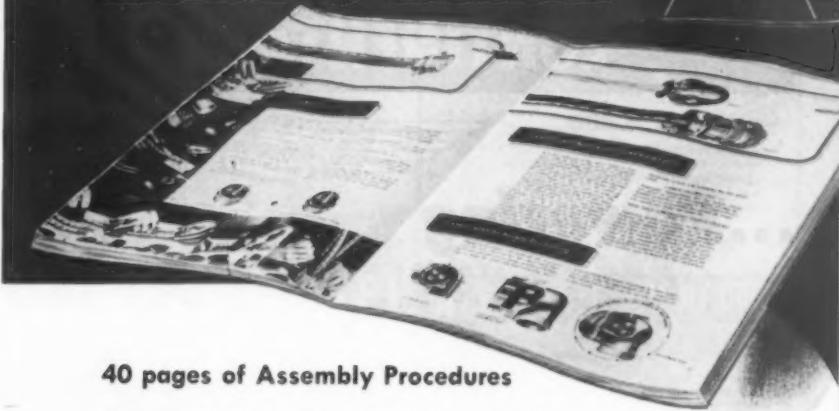
I realize that by itself this is not a noble achievement, because there were many years of sweat and blood between Jimmy Doolittle's pioneering instrument flight and the present state of airplane instrument operation. But, in regard to the helicopter, I think we have a different situation. First, we are able to take advantage of some of the pure research and engineering which have come before, and secondly, the generally misunderstood and even more deeply unappreciated ability of the helicopter to really slow down and, if necessary, to hover. That ability is the meat of the situation, and when I say "generally misunderstood," I include the helicopter boys themselves, to a very great extent.

**\* Door-to-Door Service.** I'll be damned if I'm going to have anybody steal my thunder on this subject. Under separate cover I will mail you speeches and public statements which I made several years ago and in which I definitely committed our job to closing the gap between the airport and the community. This does not have to assume the center of the community, nor does it have to assume a taxi at both ends or that a red rug has to be rolled out every time a machine squats to load or unload.

The trouble here appears to be, again, FIXED-WING THINKING, or, in other words, that the helicopter is forever committed to the rules of the game of the airplane, only, perhaps, to a lesser degree. This, too, is not so, any more than the old law of aerodynamics makes it impossible for a bumblebee to fly. We must think of the helicopter as a means of transportation not inhibited by the rules of the game of any other form of transportation. In short, it is an airplane, a truck, a boat, a train, a bus, and an automobile, all wrapped in one.

If viewed from that concept, the detail of airline connections, city or

# Introducing C-3 methods manual



## 40 pages of Assembly Procedures

The C-3 Methods Manual is dedicated to the urgency of the good workmanship that must accompany the assembly of quality cables and connectors. Each advocated procedure has passed stringent screening, not only by Amphenol's engineers, but by other recognized experts in the electronic field.

AMERICAN PHENOLIC CORPORATION  
1830 South 54th Avenue • Chicago 50, Illinois

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ POSITION \_\_\_\_\_  
ZONE \_\_\_\_\_ STATE \_\_\_\_\_

AMPHENOL

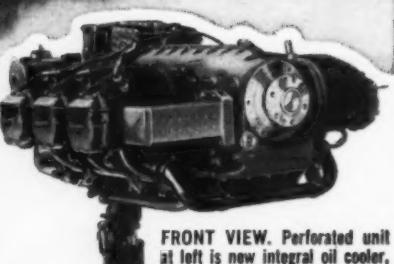
# Announcing The **CONTINENTAL 0-470-A**



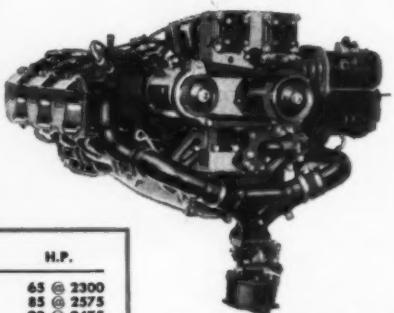
## ...Powering **CESSNA'S NEW MODEL 180**



High among the factors responsible for the splendid all-round performance of Cessna's new "Golden Year" Model 180 is its great new Continental engine. The 0-470 series provides high output—225 h.p. at 2600 r.p.m.—plus an unusual combination of other essentials bearing on safety, dependability and economy of the aircraft as a whole. One of these is extreme compactness, permitting minimum envelope; another, a brand new concept of servicing and maintenance ease. Latest in a line long famed for advanced engineering (see below) this engine will unquestionably add to the prestige of Cessna planes, and of Continental aircraft power.



FRONT VIEW. Perforated unit at left is new integral oil cooler, eliminating external oil lines. Note also new prop flange.



REAR VIEW, showing belt-driven generator; also starter mounted at angle of 90 degrees to engine's main axis. Engine is exceedingly compact.

MODEL	No. Cyl.	Type	Displ.	H.P.
A65-8	4	H	171.0	65 @ 2300
C85-12	4	H	188.0	85 @ 2575
C90-8F	4	H	200.9	90 @ 2475
O-315-A	4	H	315.0	150 @ 2500
C145-2	6	H	301.3	145 @ 2700
E185	6	H	471.0	185 @ 2300
E225-8	6	H	471.0	225 @ 2650
O-470-A	6	H	471.0	225 @ 2600
W670-23	7	R	667.8	240 @ 2200

ONLY CONTINENTAL BACKS YOU WITH ESTABLISHED WORLD-WIDE SERVICE

**Continental Motors Corporation**  
Aircraft Engine Division  
MUSKEGON, MICHIGAN

inter-city handling, will be understood, exactly as each form of transportation has had to conceive new ways and means of meeting a challenge which is part and parcel of pioneering. I can tell you that from where we sit, the solving of these appear pretty minute.

In my opinion, development will be much faster than with fixed-wing aircraft and will be influenced, not so much by the vagaries and mysteries of engineering as by the military situation, on one hand, and the enthusiastic support of our Federal Government on the other. Both of these are lengthy and separate topics, but this much should be said. During the interim period, the commercial helicopter operators undoubtedly constitute one of the greatest, if not the greatest, reservoirs of know-how and military reserve for the dollar which this country has ever received, aviation-wise.

If I had the opportunity of making one suggestion, it would be for the fixed-wing industry to avoid the pitfalls of making economic comparisons on the basis of cost per aircraft flight-mile. Much better it would be to start thinking in terms of "population units serviced," remembering, by all means, that the statisticians do not relate the per-mile cost of a Connie to the Queen Mary between New York and London . . . it's a different gadget too.

Objective reporting is a "must," and please keep it up. We are just getting our show on the road, which, in this GOLDEN ANNIVERSARY OF FLIGHT, is as it should be. In fact, what greater tribute could we pay the Wright brothers?

C. M. BELINN

President  
Los Angeles Airways, Inc.  
Box 10155,  
Airport Station  
Los Angeles 45, Calif.

**SENTINEL**  
Says:

"Use M-R-C bearings  
for better performance"

BOSCH and SCINTILLA  
magneto components

M-R-C  
bearing distributors

**SENTINEL AVIATION CORP.**  
512 North Pitt St.  
Alexandria, Virginia

AMERICAN AVIATION



## THE BULLETIN BOARD

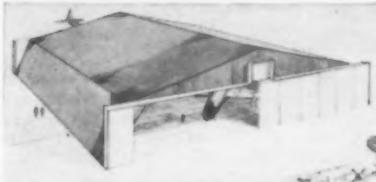
Undisplayed Advertising: \$1.00 per line, minimum charge \$4.00. Cash with order. Estimate 30 capital letters and spaces per line; 40 small lower-case letters and spaces per line. Add two lines if Box Number is included in lieu of advertiser's name and address.

Displayed Advertising: \$10.00 per inch for less than 15 inches in one issue or in any 12-month period. For more than 15 inches, \$8.50 per inch; more than 30 inches, \$8.00; more than 60 inches, \$7.50; more than 90 inches, \$7.00; more than 120 inches, \$6.50. Space units up to full pages accepted in this section for classified-type advertising.

Forms close 30 days preceding publication date. Address all correspondence to Classified Advertising Department, AMERICAN AVIATION PUBLICATIONS, 1025 Vermont Ave., N. W., Washington 5, D. C.

We are manufacturers of aircraft flared tube fittings, reusable hose fittings and Air Corps approved hose assemblies and have an excellent opportunity for graduate engineer who is sales minded to head Sales Department of Aircraft Division. Submit in detail resume of background and schooling and all pertinent information regarding experience to

**V. L. Graf Company**  
Romeo, Michigan



**IMPROVED HANGAR  
198' WIDE BY ANY LENGTH  
WE WILL ERECT ANYWHERE**  
**GEORGE D. WIDMAN, Inc.**  
17823 Evelyn Ave. Gardena, California  
MEnlo 4-3127 - Plymouth 4-2949

WASHINGTON REPR. (as reg. employee) 7 yrs. Wash. Repr. of large aircr. mfr. handling business, technical, contract and general contacts with all govt. offices, eastern concerns. MIT grad., mil. & civil flying exper., extensive respon. engrg. & exec. background in aircr. industry. Avail immmed. Resumé of qualifications on request. Box 800, AMERICAN AVIATION Magazine, 1025 Vermont Avenue, N. W., Washington 5, D. C.

Government certified specialists in hard chrome plating and grinding to specifications silver, lead, indium, tin, copper and modifications of Pratt Whitney Aircraft engine parts, tin and tin lead on Wright Aircraft engine parts. CREWS ELECTRO PLATING COMPANY, 252 N. W. 29th Street, Miami, Florida.

Wings Field  
Ambler, Pa. **WINGS, INC.** Phila. Int'l. Airport  
Aircraft Sales & Service Since 1929  
Consult Us with Confidence before  
BUYING or SELLING any type aircraft  
You Pay Nothing for Our  
EXPERIENCE and INTEGRITY  
AMBLER 1800

### DOUGLAS PARTS

#### DC3 — DC4

Fuselages—Nose Sections—Landing Gear—Main Gear—Wheels—Doors—Dem. Power Plant Units—Wings—Rudders—Ailerons—Flaps and other items as well as all component airframe parts.

Transport Aircraft—Engines—  
Airline Equipment

**IRLINE EQUIPMENT CORP.**  
Newark Airport, Newark, N.J.  
MARKET 2-0963-4

BOOKS FOUND! Free world-wide search service. Aviation history and literature a specialty. Fast service—reasonable prices. Send wants—no obligation. International Bookfinders, Box 3003-AA, Beverly-Hills, Calif.

**AERONAUTIC  
RADIO**  
MFG CO. MINEOLA, N.Y.

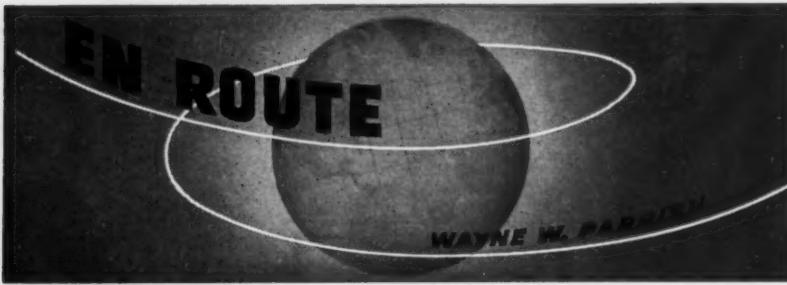
#### AIRBORNE ELECTRONICS

Distributors for  
RCA Weston Lear Gould  
Radio — Instruments — Radio — Batteries  
• **AERONAUTIC PRODUCTS:** Antenna Reels, Drag Socks, Fair Leads, Wire, Tension Springs, Insulators, Noise Filters, Microphones, Headphones, Relays, VHF Parts, Aeronautical Radio Hardware and Accessories.

### Advertisers Index

Aeroquip Corporation	64
AiResearch Manufacturing Company	27
Allison Division, General Motors Corp.	10
American Phenolic Corporation	75
Beech Aircraft Corporation	44
Bendix Aviation Corporation Eclipse-Pioneer Div.	Third Cover
Radio Communications Div.	40, 41
Scintilla Magneto Div.	62, 66
Brannif International Airways, Inc.	57
Bulletin Board	77
Champion Spark Plug Company	21
Chase Aircraft Company	74
Continental Motors Corp.	76
Douglas Aircraft Company, Inc.	25
Esso Standard Oil Company	61
Fairchild Engine & Airplane Corp. Fairchild Aircraft Div.	56, 80
Flightex Fabrics, Inc.	56
General Electric Company	36, 37
B. F. Goodrich Company	12
Grumman Aircraft Engineering	49
Hertz Driv-Ur-Self System	5
Kollsman Instrument Corporation	55
Lear, Incorporated Lear-Cal. Div.	8
Grand Rapids Div.	79
Lycoming Spencer Division, AVCO Manufacturing Corp.	58
Minneapolis-Honeywell Regulator Co.	Second Cover
Monsanto Chemical Company	3
Pesco Products Division, Borg-Warner Corp.	73
Philco Corporation	53
Philippine Air Lines	48
Phillips Petroleum Company	Back Cover
Remington Rand, Inc.	32
Sikorsky Aircraft Division, United Aircraft Corp.	28, 29
Scandinavian Airlines System	7
S. C. Aeronautics Commission	52
Temco Aircraft Corporation	11
Thermix Corporation	31
Western Air Lines	23

**UNITED AIR LINES**



**Skål!** One of the very nicest customs I've encountered around the world, and one often misunderstood by Americans, is the Scandinavian custom of *skål*.

The word *skål* was originally derived from the container from which the drink is taken, *skål* meaning bowl or vessel. Up until fifteen or twenty years ago there were very rigid rules about *skål*ing but now, particularly at cocktail parties and in informal groups, the word *skål* is synonymous with "Cheers," "To your health," "Down the hatch," and the like.

However the old *skål* traditions are adhered to at dinner parties in all of the Scandinavian countries and you almost need a book of regulations to understand all of the fine points. Like everything else there are variations upon variations, and among the countries, but what most visitors to Scandinavia often don't know is that at dinner parties *skål*ing is carried on only between two persons at a time except at the beginning and end of the dinner.

**Dinner on the Dot.** I've been to a few fairly large dinner parties in homes in all three countries and I must say that *skål*ing adds a great deal to the warmth and friendship of such occasions and I hope the Scandinavians don't get so Americanized with pre-dinner cocktail drinking that they let the customs pass out of existence.

If you are invited to dinner in Sweden, for example, you are expected to arrive right on the dot. If the invitation is for seven o'clock, you are not expected to arrive at one minute after seven. And if the dinner is traditionally Swedish, the guests don't engage in cocktailting for an hour, they go right in to dinner.

The first course is *Smörgasbord*, the Scandinavian version of the French *hors d'oeuvre*, accompanied by snaps or aquavit, that potent liquid with alcoholic content of from 40% to 46%. Snaps are never to be drunk without food and you aren't supposed to bottoms up. But snaps do give you a fine edge for a good dinner.

**Welcome to All.** Shortly after sitting down at the table, the host raises his glass of snaps in a *skål* of welcome to all of the guests. From then on until the end of the dinner there is *skål*ing under way constantly, but always between two people only. Guests never *skål* the host or hostess although the host and hostess usually *skål* each guest.

There is a special technique to *skål*ing. You raise your glass slightly, catch the eye of the individual you want to *skål*, smile, say "Skål" and

usually address the person by name, drink, then salute with your glass, and put down your glass. The salute and the second look at the person you're *skål*ing are important—the transaction is thus completed. Never at a dinner party do you *skål* more than one person at a time, or lift your glass and *skål* the dinner table, as one might do in the U.S. or England with a general "Cheers" to all within hearing.

**Don't Skip Anyone.** Thus the *skål* at a dinner table is a very personalized and individualized matter. If you fail to *skål* someone it may well be interpreted as disliking the individual. *Skål*ing is a token of friendship and of greeting.

You *skål* with whatever liquid happens to be in front of you. At formal dinner parties a small glass of beer follows the snaps, and white wine accompanies the inevitable fish course and red wine follows with the meat course, and then comes champagne, madeira wine, or sherry, and then brandy.

Unless you've been loaded up with American-type cocktails before dinner, this succession of drinks—which you don't take too much of any one—leaves you with a substantial warm glow by the end of the dinner. If you drink everything that's set before you, you'll end up with more than a glow.

**Thanks for the Dinner.** At the end of the dinner, the guest of honor, who sits at the left of the hostess instead of the right as in the U.S., calls for attention and raises his glass and thanks the host and hostess for a very fine dinner. It seems to me that this thanks on behalf of all of the guests is a very nice touch to the affair. This is the only other time when everybody *skål*s at once.

Another custom which is quite rigidly observed, at least in Sweden, is that when you meet your host next time, no matter if it's a year later, the first thing you do is to thank him for the wonderful dinner you enjoyed at his home.

In older times *skål*ing was quite a hidebound custom. At stag affairs, for example, the man who was *skåled* had to return the *skål* within a very short time limit. But Scandinavians are loosening up on tradition and customs, like everybody else, and today you'll hear the word "skål" replacing "cheers" at cocktail parties and informal groups. But dinner *skål*ing is widely observed and practiced according to the rules, especially if there are only a few outsiders present.

**Germany.** Turning from Scandinavia a moment, I dropped into Cologne,

Germany, for a few days last November after flying from Los Angeles to Copenhagen, and was again struck by the rapid manner in which the Germans are staging a recovery from the devastating bomb raids of World War II.

Right after the war I flew over Cologne on a press bombing survey and was staggered by the ruins of this large city. The magnificent Gothic cathedral, one of the finest in Europe, had not received a direct hit from bombs, but a very large area in every direction from the structure was bombed or burned to bits. I thought it would take twenty years for Cologne to come out of the ruins.

I can assure you that Cologne is still one of the best examples of bombed cities to be found in Europe today, but it is equally impressive for what's been done to rebuild the business area. I dropped into a late morning service at the cathedral and, while some of the church is still closed, the roof is back on and a great deal of restoration has been completed.

**Good Food.** Around the cathedral new buildings have sprung up, all with modern fronts and sprightly window displays. I stayed in the Dom Hotel, on the cathedral square, and although my room looked out on a ruined section of the original hotel, my room and the new wing were well built, modern, and comfortable. You don't need an alarm clock at the Dom. The cathedral bells ring out every fifteen minutes and at 7 a.m. they go all out for quite a spell to wake up the city.

On the cathedral square, too, is a very fine new restaurant called the Martin Wiesel. It's plush. The menu and cooking are very excellent and I couldn't help but contrast the quality and variety of food with London, to which I was going from Cologne. The service was courteous to an extreme.

If you wander down some of the business streets you're apt to think there has been no bombing, but if you look a little closer you'll discover that the new small buildings mask an awful lot of vacant areas. There are many square blocks with no restoration at all, but the streets are all clean of rubble.

**Too Many Ruins.** Not far from the cathedral there had been a big museum which was totally destroyed by bombs. In the small park area adjoining what once was the museum there is an old Roman arch, a sarcophagus, and other relics of an earlier age. For blocks in every direction there are ample ruins from World War II, and the historic old relics blended in with the new ruins so much that I had to look twice to make out which was Roman and which was 1942-45.

Between the cathedral and the Rhine river there is a brand new museum. It seems that when the Germans were building an air raid bunker during World War II they uncovered some Roman ruins, so now they have excavated quite an area and you'll find a fine old Roman tiled floor and other ruins on display. Cologne, it seems, is one of the oldest cities in Germany.

One thing is still mighty awful in Cologne—that's the liquor. Wines are fine, but anything else that's sold under the name of whiskey, gin, and the like, is straight poison. Otherwise the Germans are looking up.

# UNSEEN HANDS ABOARD THE FAIRCHILD C-119

From nose to tail, the famous Fairchild "Flying Boxcar" is manned by unseen hands—4 different types of Lear Products, performing a dozen different tasks. Included are such precision-engineered electro-mechanical products as Linear and Rotary Actuators, Flexible Shafting and Screw Jacks.

Operating cowl flaps, trim tabs, air exit flap, main gear up-lock, paratainer door—helping regulate and control the flow of air to engine, cockpit, and cargo—performing many other exacting and varied tasks, Lear electro-mechanical components and systems are making essential contributions to the vital service rendered by the C-119.

In the field of electro-mechanical actuation and controls, twenty-one years of engineering development, design, and precision manufacturing have earned for Lear a position of recognized leadership in flight control.



**LEAR LINEAR ACTUATOR Series 401**—precision engineered, installed in military and commercial aircraft, is typical of the Lear electro-mechanical actuators designed to meet the exacting requirements of the C-119.



ROTARY ACTUATORS



POWER UNITS



ELECTRIC MOTORS



SCREW JACKS

**OTHER  
ELECTRO-MECHANICAL  
EQUIPMENT:**

- Electronic Temperature and Positioning Controls
- Magnetic Clutches
- Sub-Miniature Motor Generators
- Motor-Driven Precision Gear Mechanisms
- Servo Motors

## A Fairchild C-119 Flying Boxcar



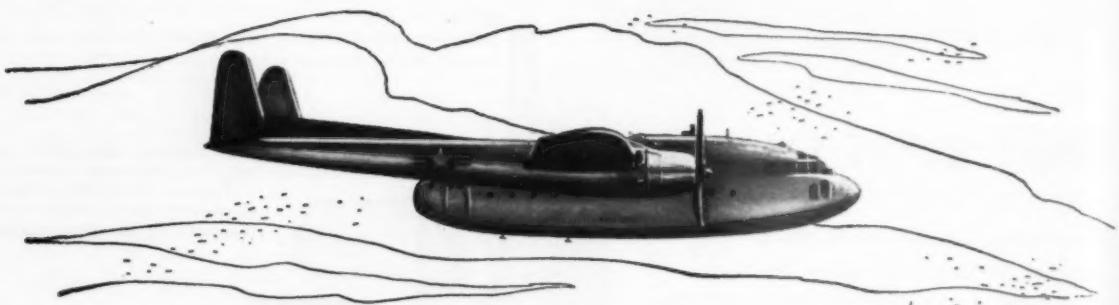
will easily carry

four 250 gallon water trailers (loaded)



plus eight supply men into forward combat

areas...and it is being done day after day!



ENGINE AND AIRPLANE CORPORATION

**FAIRCHILD**

HAGERSTOWN, MARYLAND

*Aircraft Division*

Other Divisions: Guided Missiles Division, Wyandanch, L.I., N.Y. • Engine Division, Farmingdale, N.Y.

# News at Deadline

## Fred Lee Slated to be CAA Administrator

Appointment of Fred B. Lee, deputy administrator of the Civil Aeronautics Administration, as the new CAA administrator, is expected momentarily. Although his nomination had not been sent to the Senate at this writing, Lee has been offered the appointment and is expected to accept it. Lee, a Republican who has strong industry backing for the post, also had the support of a strong Congressional contingent and even that of the present Administrator, Charles F. Horne who, not very hopefully, had sought reappointment.

## Nyrop Named Counsel To Local Service Lines

Donald W. Nyrop, former chairman of the Civil Aeronautics Board, has accepted a position as Washington counsel for the Conference of Local Service Airlines, a newly formed group which will attempt to solve many of the small carrier's current problems. High on the list of immediate projects is an attempt to determine if the local service carriers can finance new aircraft and, if so, whether one of the U.S. manufacturers will build such an aircraft. He will also seek a definite policy on the troublesome certificate renewal problem which has stymied the lines' attempts to get needed financing or even attract suitable personnel.

Nyrop's appointment was made by an executive committee of the new conference comprising Earl McLaughan, president of Trans-Texas Airways, Robert Peach, executive vice president and general manager of Mohawk Airlines and C. A. Myhre, executive v. p. and treasurer of Frontier Airlines. Nyrop has joined the law firm of Klagsbrunn, Hanes and Irwin in Washington, D. C. a firm representing chemical, steel and other interests which has not previously been identified with aviation. He has agreed to serve as counsel for the local carriers until their annual meeting next December.

## USAF Orders C-131C's, Cargo Version of CV-340

"A large number" of Convair C-131C cargo aircraft have been ordered by the U.S. Air Force for use by the Strategic Air Command and Tactical

Air Command. The C-131C is first military version of the commercial Convair 340 to be ordered. Powered by two Pratt & Whitney R2800 engines rated at 2500 horsepower each, driving Hamilton Standard propellers, the C-131C airplanes will have a 120-inch cargo loading door and cabin floor stressed for 200 pounds per square foot. Several versions of the earlier Convair 240 have been ordered and are in service with the USAF.

## Douglas Gets USAF Post, Replaces Gilpatrick

Nomination of James Henderson Douglas, Jr. as Under Secretary of the Air Force to replace Roswell L. Gilpatrick has been submitted to the Senate by President Eisenhower. Douglas, 53, is a Chicago attorney, an American Airlines director and a veteran of both World Wars. He served as a colonel and chief of staff of the Air Transport Command during the last war.

## Settlement Near In United Coach Fight

Deadline for United Air Lines to answer CAB's complaint regarding tariff violations involved in the operation of Douglas DC-4's with 54 seats, a move which United undertook as a "safety" measure, has been extended from February 24 to March 10. Meanwhile a compromise settlement of the controversial issue is understood to be near at hand.

## JAL Ordering DC-6B's

Firming up earlier reports that Japan Air Lines would buy American built equipment, a group of JAL representatives is enroute to this country for the purpose of purchasing three Douglas DC-6B's.

## Dallin Ousted, Inwood Declines Airport Post

The long-smoldering controversy involving Philadelphia's Bureau of Aeronautics flared up February 14 with the suspension of J. Victor Dallin as the Bureau's chief and the invitation by the city to Louis R. Inwood, director of aviation for Kansas City, to replace Dallin.

Dallin is fighting the ouster vigorously and Inwood, who was to get the invitation February 20, indicated he would not accept the post. Meantime the city named Francis T. Fox, manager of Worcester, Mass. municipal airport, as acting chief of the bureau pending the naming of a replacement for Dallin. Fox had already accepted the \$8,250-a-year post as Dallin's deputy when the controversy flared up involving the city council and city officials and the controversial airport program. Inwood is the current president, and Dallin the past president, of the Airport Operators Council.

## Fairchild J44 Jet Powers Ryan Firebee

Details of Fairchild Engine Division's 1,000 pound-thrust J44 engine were disclosed last week including information that the 300-pound engines is being used to power the Ryan Firebee, a high-speed, high altitude target plane. The J44, which is 72 inches long and 22 inches in diameter, is of monocoque construction using an outer sheet metal cowl to form a pressure chamber and a frame structure connecting the two main bearing supports. The monocoque design principal, which Fairchild says can probably be used in larger engines for piloted planes, reduces the turbojet engine to its basic structural requirements.

## Plastic Planes Defeat Enemy Radar Screens

Complete structures of supersonic aircraft and missiles capable of eluding enemy radar screens are now completely feasible, according to William E. Bradham, formerly with Lockheed and now chief engineer of Zenith Plastic Company. He described the material, developed by Bakelite Co. and coated on Fiberglas cloth, as being almost completely "electronically transparent," lighter than most metals, capable of holding strength better than aluminum and steel alloys in high speed flight and capable of mass-production at one-fifth the cost of metal airframes.

## Republic Raise Sets Record Wage Level

In a wage hike said to make its employees the highest paid airframe workers in the industry, Republic Avia-

tion Corp. and the AFL-Machinists have agreed to an 8¢ blanket wage hike for 22,000 production workers, an increase in night differential from 10% to 12%, a third week of vacation after 15 years service and accrual of vacation pay.

## Carlene Roberts Scores CAB Decision-Making

Miss Carlene Roberts, Vice President of American Airlines, has sharply criticised the Civil Aeronautics Board. In a speech before the Wings Club, she said "there has been growing doubt in the minds of many that the agency has carried out its functions under the Civil Aeronautics Act."

Criticising the CAB on many counts, Miss Roberts said that if decisions are not founded on facts, "there might just as well be no government agency at all." Miss Roberts outlined several approaches to the making of CAB decisions which might be arbitrary and non-factual. "Such approaches result in instability, uncertainty, and unrest in the industry, and they encourage political interference with the regulatory process," she declared.

## All-cargo N. Atlantic Service for British Line

A British independent airline, Airwork Ltd., has been granted a 10-year license by the British Government to operate all-cargo services to New York and Montreal. Two Airwork officials, M. D. N. Wyatt and Sir Archibald Hope are visiting in the U.S. and Canada, reportedly investigating the equipment problem. Airwork has previously indicated it would use Avro Tudors or Yorks on all-cargo flights. The company faces a serious "dollar problem" in getting U.S. equipment but another British independent with Canadian dollar resources, Hunting Air Transport, might abandon its application for this type service and join with Airwork to eliminate the problem.

Meanwhile British Overseas Airways Corp. is planning to apply for an all-cargo certificate for Atlantic service starting late in 1953 or early 1954. Airwork has previously indicated it would start all-cargo service June 1, 1953.

## McCulloch 'Copter Gets CAA Certificate

McCulloch Motors Corp. has been granted a CAA certificate for its tandem rotor MC-4 two-place helicopter, a craft with a useful load of 700 pounds

and range of 200 miles at 75 miles per hour. Powered by a 200 horsepower Air-cooled Motors engine, the MC-4 has a service ceiling of 10,000 feet and features a multiple vee-belt main drive.

## 83-passenger Boeing Set for NWA Service

Completion of the first 83-passenger conversion of its 75-passenger Boeing Stratocruisers has been completed by Northwest Airlines at a cost of about \$10,000 and plans call for converting the entire fleet to this configuration by June 1. The eight additional seats, which will not be used on the NWA Orient route because of gas load problems, will make available 4,000,000 additional seat miles per month with a potential earning capacity of \$244,000.

## Capitol Spotlight on National DC-6 Accident

A demand for a Congressional investigation into the National Airlines DC-6 crash in the Gulf of Mexico on February 14 has been called for by Rep. Hale Boggs (D., La.). Boggs cited information regarding the mandatory rework of the Douglas DC-6 wing spars ordered by CAA last July. This inspection and reinforcement, required on all airplanes having more than 4,000 hours flight time, is said to have been completed on the National Airlines plane involved in the accident.

## \$12.5 Million Net for American in 1952

American Airlines' net income for 1952, after taxes, was \$12,514,000, compared with 1951 earnings of \$10,548,000. Revenues for 1952 totaled \$187,344,000, highest in the company's history and \$24.4 million above 1951's revenues. Operating expenses per revenue ton-mile were up 4.7% over 1951 but the increased costs were experienced largely in the first half of the year with the last six months showing improvement. Earnings were equivalent to \$1.72 per common share.

## Defense Spending Limit Invites Chaos: Peale

Attainment of the 143 wing goal of the U.S. Air Force would be pushed back into 1957 or 1958 by the reported attempts in Congress to impose a limitation on defense spending in fiscal 1954, according to Mundy I. Peale, president of Republic Aviation. Noting that most

of the money to be spent in 1954 was appropriated as far back as 1950, Peale said: "You set up the plant in 1951 with 1950 money, you install machines in 1952 and pay with 1951 money, and so on. To slap on a ceiling in 1954 and cut off payments scheduled as far back as 1950 would be to invite chaos—and also a mass migration out of the aircraft industry."

Speaking at a luncheon meeting of the Poor Richard Club in Philadelphia, Peale said proposed cuts in aircraft research and development—slashing from \$62 million in 1952 to \$59 million in 1953 and to \$28 million in the 1954 budget is "a risk we can not afford to take." The entire allocation of \$28 million, if used exclusively for new aircraft prototypes, would allow for no more than two planes.

## AEPC Buys AAS Stock: Officials Form New Co.

Aircraft Engineering and Parts Corp., 345 Madison Avenue, New York City, has bought 100% of the stock of American Air Service Inc., Charlotte, N. C., in which firm it was a majority stockholder. The former vice president and general manager of American Air Service, E. DeForest Winslow, and the former treasurer, Richard R. Lisk, have sold their respective interests and formed their own firm. The new firm, E. DeForest Winslow & Associates, Inc., 2846 Dorchester Place, Charlotte, N. C., will deal with aviation insurance, consultation, appraisal and supply.

## Northwest Expected to Buy 22 Super Connies

An order for 22 Lockheed Super Constellations for Northwest Airlines is reportedly hinging on Lockheed's agreement to lease or rent the carrier a number of earlier models between now and late 1954, when the new aircraft would begin to arrive. The order would total almost \$30 million, with delivery set at two or three aircraft per month.

## Northeast Gives Up 5 Convair 340's

Five Convair 340's which were scheduled to be delivered to Northeast Airlines have been sold instead to Airfleets Inc., a subsidiary of Convair, who in turn has sold three of the planes to Alitalia, Italian airline. Northeast was unable to absorb the order of five due to financial difficulties, according to president George Gardner.

# The Solid Core of a Production Miracle



Here you see the real reason why Eclipse-Pioneer has achieved its "miracle" of expansion—a five-fold expansion of output without sacrifice in the precision standards of its products. The reason is people—*experienced* people—craftsmen, engineers, and executives with matchless know-how and the *ability to pass it on to others*. Because Eclipse-Pioneer is the type of company doing the kind of work which attracts first-class

talent, we have been able to put into action against one of the biggest jobs in industry hundreds and hundreds of skilled people who have plied their talents with the Company for more than a decade—many for over two decades. It is this solid core of know-how—*unique in the field*—which has enabled us to expand production output to 514% of its pre-Korea level. It could have been done no other way.

## PRECISION PRODUCTS\* MADE BY ECLIPSE-PIONEER

Automatic Pilot and Flight  
Path Control Equipment

Airplane and Engine  
Instruments

Flight and Navigation  
Instruments

Power Supply Equipment

Air Pressurization and Ice  
Elimination Equipment

Engine Starting Equipment

Oxygen Equipment

Precision Components for  
Servomechanisms and  
Computing Equipment

Sand, Permanent Mold and  
Die Castings of Magnesium  
and Aluminum

Plaster Mold Castings

\*Manufacturing capacity is now available for a great  
many models of these products.

# Eclipse-Pioneer

TEREBORO, NEW JERSEY • DIVISION OF



AVIATION CORPORATION

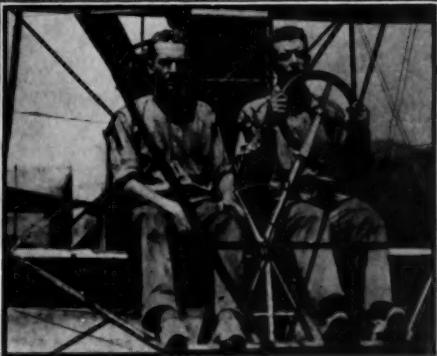
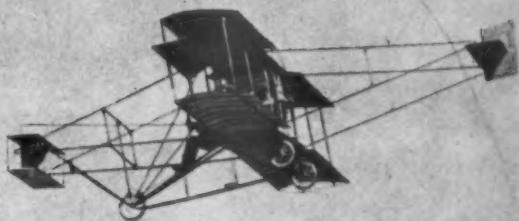
WORLD'S LARGEST PRODUCER OF AVIATION INSTRUMENTS AND ACCESSORIES

Export Sales: Bendix International Division

72 Fifth Avenue, New York 11, N. Y.

# The Navy Learns to Fly —

1911



In June of 1911 Lieut. John H. Towers (left) and Lieut. T. H. Ellyson (right) were ordered to Hammondsport, N. Y. to be taught to fly at Glenn Curtiss' flying school. They were the Navy's first two air pilots, and subsequently both were to rise high in the ranks of the naval air service.

Our nation's naval air arm has come a long way since the days when the young Lieutenants Towers and Ellyson learned to fly.

And through the years, these great advances in aeronautical engineering have been matched by equally important developments in aviation fuels.

Phillips Petroleum Company, a pioneer in the development of fuels for all ranges of flight, is today one of the country's largest suppliers of aviation gasolines for commercial, military and private use. Phillips is always ready with new fuels for the very latest developments in turbo-props and jets . . . in addition to supplying great quantities of 115/145 grade aviation gasoline.

Rely on Phillips for dependable, high performing aviation products.

AVIATION DIVISION  
PHILLIPS PETROLEUM COMPANY  
BARTLESVILLE, OKLAHOMA



The Naval Air Cadet's first landing on an aircraft carrier marks his promotion from cadet to full-fledged naval aviator. Here the pilot of a U. S. Navy Skyraider receives instructions for landing aboard the U.S.S. Tarawa.



AVIATION PRODUCTS

1903



50TH ANNIVERSARY OF THE AIRPLANE

1953